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Founded by James Pleasant Parker.

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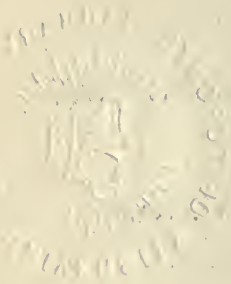
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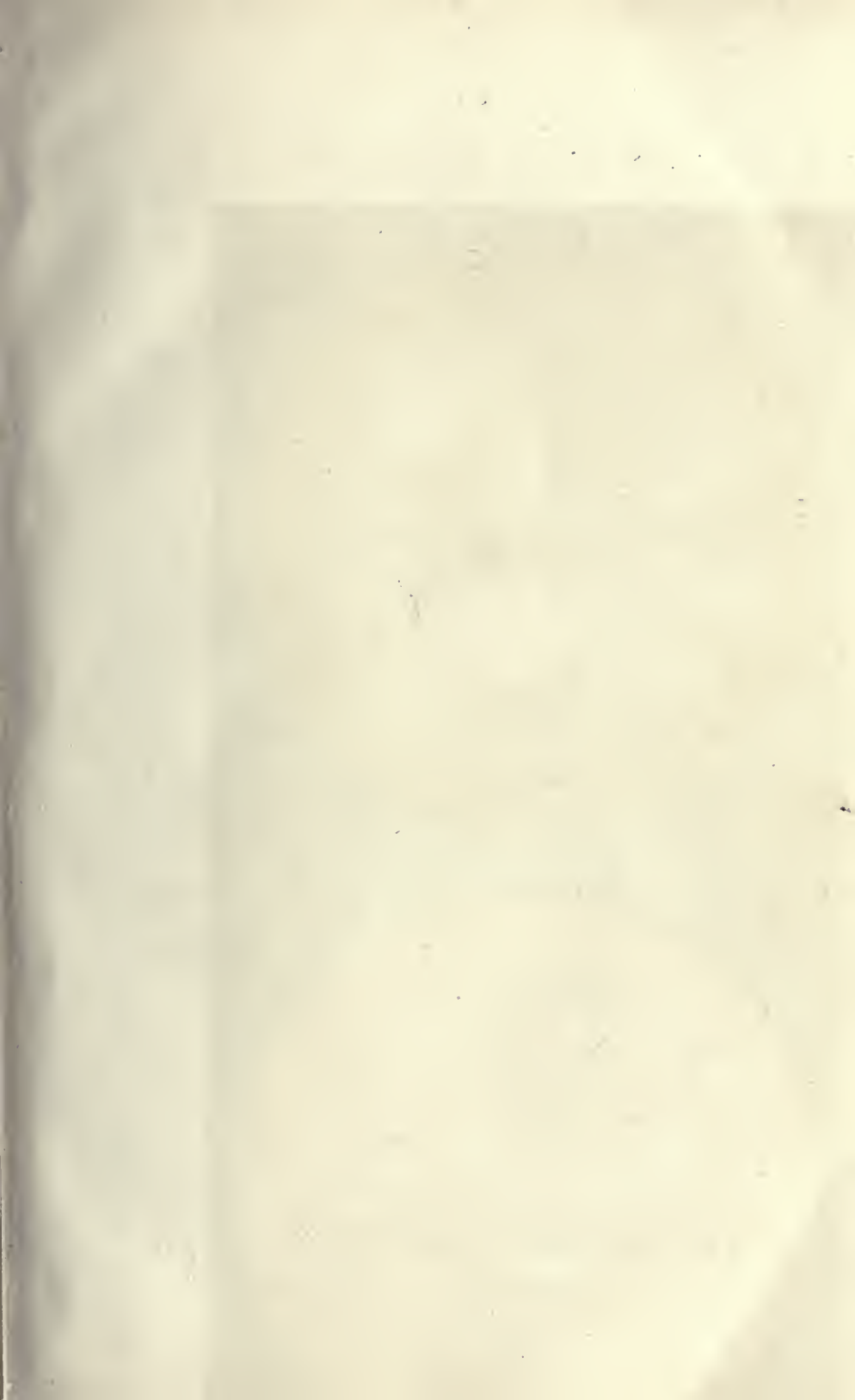


PLATE III.



Margaretha Washington pinx.

Fig. 5.

Fig. 6

PLATE II.



Margarella Washington pinxt

Fig. 3.

Fig. 4.

F. Moras lith. Pin.

PLATE I.



ANNALS OF OPHTHALMOLOGY.

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No. 1.

A STUDY OF THE OPTHALMIC CHANGES IN CHLOROSIS. PERNICIOUS ANEMIA AND LEUCOCYTHEMIA.*

BY CHARLES A. OLIVER, A. M., M. D.

ONE OF THE ATTENDING SURGEONS TO THE WILLS' EYE HOSPITAL;
ONE OF THE OPTHALMIC SURGEONS TO THE PHILADELPHIA HOSPITAL, ETC.

[Illustrated by colored plates and drawings in the text.]

Through the kindness of several of my friends the following most interesting grouping of cases has been studied both clinically and histologically in different departments of medicine, making a series of studies, both by them and him, that for thoroughness of detail, conscientious work and completeness, have seldom been permitted in any single contribution that I have had the privilege to heretofore publish. Each department of work having been superintended by one who is competent in the performance of his duties, and the studies having been done simultaneously, the list of cases here given becomes not only valuable as a symposium of result, but must be considered as useful in illustrating the differences of expression in the ocular changes found in a few of the most important of blood dyscrasia.

Beginning with the commonest variety in which there is a lessening of the number of the red corpuscles in the vascular channels, producing, or at least associated with, the usual train of subjective and objective symptoms (mostly of a functional type), the evil consequences of diseased condition of the blood-making organs, of improperly functioning blood-material, and of irritated, inflamed and de-

*Read before the American Ophthalmological Society at the Fourth Triennial Congress of American Physicians and Surgeons, May, 1897.

generate contiguous tissue and related viscera, are all soon reached. Each form of disorder having some organic causal basis, each possessing some peculiarity by which its type is known, and each evidencing its presence by a grouping of interdependent symptoms, it cannot be wondered that the ocular signs may in many instances be considered pathognomonic. Especially is this so in the vascular changes, both in and about the eyeball; changes that are not only recognizable to the naked eye and to the magnifying lens, but which are so plainly manifest to the ophthalmoscope.

When to this clinical study, careful post-mortem examination, both macroscopically immediately after death, and with the microscope after certain chosen tissues have been properly hardened and appropriately stained, has been made, the relative changes found in the different forms of disorder at once assume a value that cannot be underestimated.

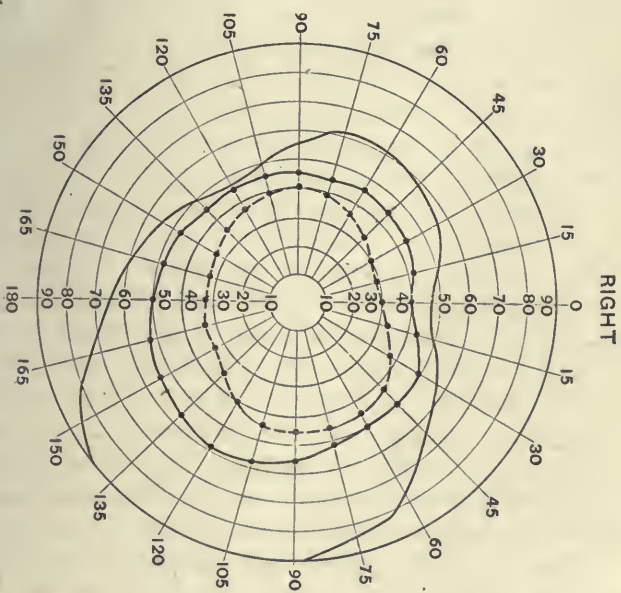
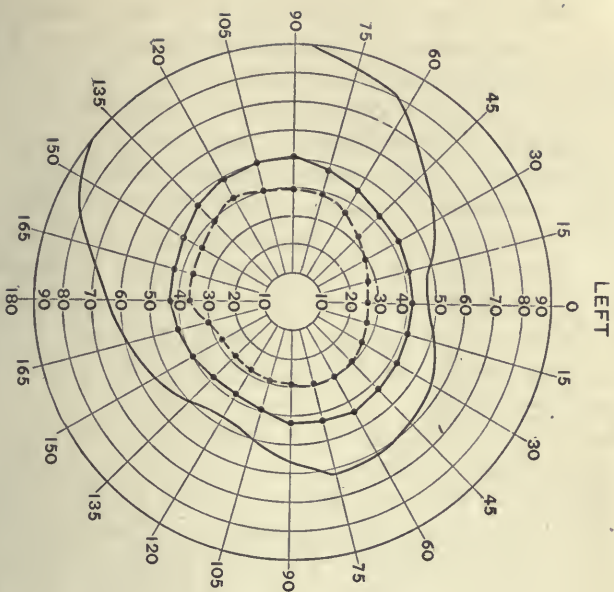
The subject-matter in this paper embraces an analysis of six cases recently seen in my practice.

Case I.—*Chlorosis in a young female. Marked Neuro-retinitis without any pronounced ocular symptoms. Diminution of red corpuscles to less than one-third of normal, with great lessening of hemoglobin. Subsidence of inflammation of nerve-head and surrounding retina, with restitution of blood constituents to proper proportions by the administration of iron.*

On the third of February, 1897, M. J., a seventeen-year-old school-girl, applied at my clinic at Wills' Eye Hospital. In addition to her eye symptoms (blurring of vision, with intense right-sided supra-orbital pain, increased by near-work), she gave most if not all of the typical gross signs of chlorosis. There were dizziness, vertigo, tinnitus aurium, neuralgia, tachycardia, capricious and weakened appetite, scanty menstruation and chronic constipation; this grouping in spite of treatment, having increasingly persisted for more than two years.

In appearance she was small, though fairly framed and well developed for her age. Her face presented the characteristic greenish pallor of the disorder. Her lips were pallid, her conjunctivae were blanched and her sclerotics were pearly white.

Distant vision in the right eye was reduced to two-thirds, whilst that of the fellow eye was normal. Accommodative



SKETCH 1.

play was good. The pupils equalled three millimeters in size and the irides responded freely to light, accommodation and convergence. A slight exophoria for distance existed. Ophthalmoscopic examination revealed a well pronounced neuro-retinitis that was different from that seen in association with gross refractive error. The disc was somewhat pallid. There was chorioidal pallor, marked tortuosity of the retinal vessels, especially of the veins, with a slight flattening of the venous walls, and a broadening of the light-reflex upon the arteries, with a tendency to pallor of the contained currents. These conditions were more marked in the left eye, as shown in figure 1, plate 1, made from a water-color sketch by Miss Margaretta Washington of this city.

In each eye there was a low degree of compound hypermetropic astigmatism.

The fields of vision for red and white, as can be seen in the accompanying charts (sketch 1), were diminished, this contraction being more marked in those belonging to the eye with the greater degree of neuro-retinal inflammation.

Careful examination for the determination of any gross physical signs failed to show any evidences of organic disease. The urine, which was quite transparent and clear, and which was of normal reaction, had an average specific gravity and was devoid of any sediment.

Believing the ocular symptoms to be dependent upon the general condition, and as there did not seem to be anything else to account for the patient's depraved health but a deficiency of some type in the blood, I sent her to Dr. Alonzo Englebert Taylor, Associate at the William Pepper Laboratory for Clinical Medicine, whose skillful and frequently repeated examinations substantiated my view of the case and fixed the diagnosis. He found that the red cells equalled 2,600,000, that the white ones numbered 5,624, and that the hemoglobin amounted to but twenty per cent. The red cells were very pale, there was some poikilocytosis, with a few normoblasts. Differential count of the leucocytes showed them to be normal.

One week later, the patient having been placed upon full doses of Bland's pills and situated under the best hygienic conditions that could be obtained, it was found that the red cells equalled 2,500,000, the leucocytes numbered 12,084, while the hemoglobin had increased to twenty-four

per cent. At this examination there was the same condition of red cells. As may be noticed in this report, an ordinary "digestion leucocytosis" was manifest.

Two weeks following, under the same treatment and improved surroundings, the red cells rose to 3,280,000, and although the white cells equalled but 2,226 (which was to be accounted for by a temporary fasting), the hemoglobin had increased to forty-five per cent. (more than double of what it had been three weeks before). No nucleated red cells could be found. The other conditions of the blood were the same as before.

Two weeks later under a continuance of the same plan of treatment, the red cells had increased to 4,090,000. The white cells had risen to practically normal (5,624), and the hemoglobin had gotten to seventy-five per cent.. For the first time the blood in stained preparations appeared about normal.

A fortnight later, the blood constituents were quite normal, the red cells equalling 4,190,000, the white ones amounting to 5,080, and hemoglobin having risen to eighty per cent.

As the result of these examinations, Dr. Taylor stated "I think that the case is one of pure chlorosis, and the blood regeneration under treatment very striking."

Coetaneously with the betterment of the blood, the neuro-retinitis subsided, leaving but a few insignificant traces of degeneration and thickening. Vision, which was unimproved by lenses, rose to normal, and the visual fields for both form and color became full and properly saturated in tint.

Case II.—*Anemia probably secondary to some trunkal neoplasm in a middle-aged, otherwise healthy woman. Ophthalmoscopic picture of early changes in chorioid, retina and optic nerve.*

On the second of March, 1897, I was privileged to commence a series of studies upon A. McC., a fifty-four-year-old Irish woman who was in the medical wards of the Philadelphia Hospital under the care of my colleague, Dr. Frederick P. Henry.

Without any family history of relevant character, she stated that for one year past she had suffered from general malaise, impaired appetite, diarrhea, and gastralgia, accompanied at times, with bilious vomiting. As a rule

the emesis followed the ingestion of a hearty meal and was associated with lancinating pains in the precordial and epigastric regions. Gradual increasing emaciation was taking place.

When first seen she was extremely weak. A harsh systolic murmur seemingly not hemic in type, could be heard over the cardiac apex and about the left second cartilage.

Examination of the urine proved negative. An extended study of the blood showed a normal count for the white corpuscles. The red cells, however, which were in various stages of degeneration, were diminished to but 1,050,000, while the hemoglobin was reduced to twenty-five per cent.

The pulse grew rapidly feeble. The murmur could be heard over the entire cardiac area. The skin and conjunctival surfaces became distinctly lemon-tinted. A week later, marked tingling in the extremities and anasarca appeared. At present writing, the patient is much worse and is not expected to live.

The ocular examination of this case of pernicious anemia caused by some probable gross neoplasm, was extremely interesting.

Corrected vision in each eye, showed that that of the right was equal to but one-third of normal, while that of the left eye, was not far from proper acuity. The accommodative play was excellent. The fields of vision, which were concentrically reduced to about one-half, failed to evidence (in an intelligent patient) the existence of any scotoma. The right pupil was a trifle the larger, this probably being partially dependent upon a moderate degree of myopia with slight astigmatism.

The irides enjoyed free play to light-stimulus and efforts for accommodation and convergence. Thirteen degrees of exophoria for near and far, with four degrees of hyperphoria at five meters' distance, showed at once a pronounced disturbance in the extra-ocular muscle equilibrium.

The condition of the eyegrounds, which are well represented in the accompanying reproduction (Fig. 2, Plate 1,) of a water-color sketch made by Miss Washington, showed a picture that could be fairly attributed to the blood disturbance; *i. e.*, it was expressive of the earliest ophthalmoscopic appearances found in pernicious anemia. As can be seen, there was an incipient neuro-retinitis with a low grade edema. Tortuosity of the retinal vessels, a

darker venous current and a paler arterial one than normal, a slight pallor of the chorioidal tissues, and a tempero-macular grouping of deeply seated blood degeneration spots, all were manifest.

Case III.—*Unmarried Negress comes for correction of slight refraction error. Conjunctiva almost transparent and scleras excessively pale. Sclerosis of nerve fibre layer of retina. Yellowish pallor and apparent dense hardening of optic nerve head. Retinal vessel currents pallid, with lymph-sheath wall thickening and opacification. Examination of blood proves the case to be one of pernicious anemia. Recovery doubtful.*

Through the recommendation of Dr. Samuel P. Bartleson, of Clifton Heights, in this state, A. M., an unmarried Negro of twenty-three years of age, came to Wills' Eye Hospital on the fourth of November, 1896. The patient complained simply of cephalalgia situated in the vertex and supra-orbital region, which was increased by near work. Her distant vision in each eye equalled two-thirds of full acuity, and her accommodative range and region were both proper for her age and refractive condition.

The pupils were oval with their long axes, which were about three millimeters each in length, situated slightly down and out. The irides were prompt and responded equally to light stimulus and efforts for accommodation and convergence. There was a slight exophoria for distance.

Closer inspection showed that the conjunctivæ were almost transparent and that the scleras, where not covered with pigment, were excessively pale.

Ophthalmoscopic examination revealed a remarkable picture in each eye. As shown in the accompanying reproduction of a sketch of the right fundus by Miss Washington (Fig. 3, Plate 11,) the surface of the disc was of a mottled yellowish white. Its edges were hazy and at places were almost indiscernible. The fibre-layer of the retina, which itself was visible to a more or less degree throughout the fundus, was thickened, opaque, and intensely striated. The underlying chorioid so unlike that which is so common in the Negroid race, was but sparingly and irregularly pigmented. The retinal veins and arteries, particularly the former, were pallid, with a thickening and pronounced opacification in many places of their lymph-sheath walls. To the nasal side of the disc two faintly marked lymph massings could be dimly seen.

The fields of vision for white and red, especially the former, as shown in sketch 2, were markedly contracted.

Careful testing and retesting of the urine failed to show any coarse disturbance or evidence of general dyscrasia.

In consultation with my colleague, Dr. William F. Norris, we both believing the case to be one dependent upon general dyscrasia, I sent her to Dr. Taylor at the William Pepper Laboratory of Clinical Medicine, with the request that he make an analysis of her blood.

The result as here given, far exceeded my expectations. The red cells amounted to but 1,608,000, and the white ones were decreased to 3,490. The hemoglobin equalled but twenty-two per cent. The red cells were quite irregular in size, both microcytes and macrocytes being present. A few nucleated red cells could be seen, but there were some of all types, None of them could be determined to be in the process of cell division.

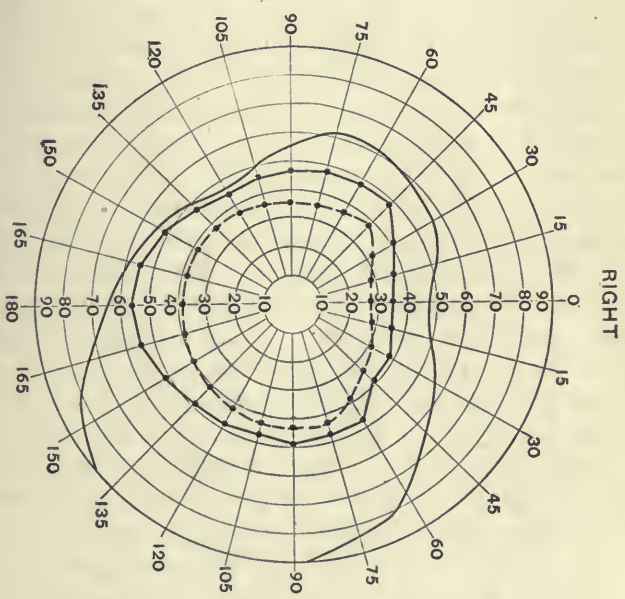
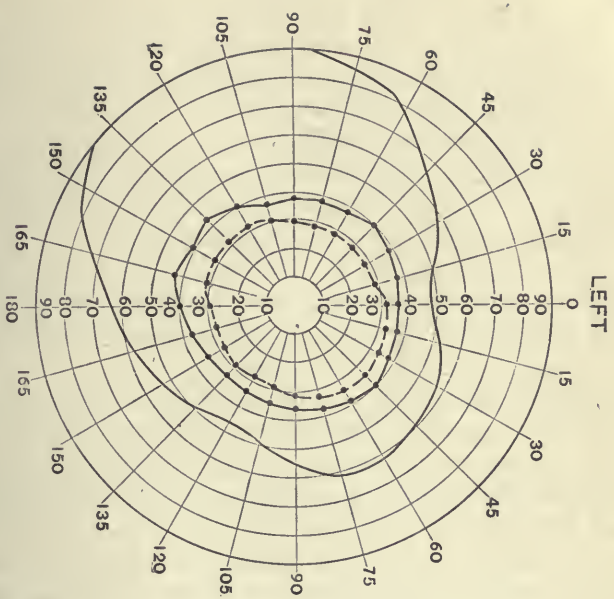
A differential count of the leucocytes, gave the following remarkable result: Neutrophilic polynuclear cells were found to the amount of 51.2 per cent.; the oxyphilic polynuclear cells equalled 2.4 per cent.; the monocular and transitional cells had risen to 15.2 per cent.; while the lymphocytes amounted to 31.2 per cent., making the total of 100 per cent. bulk.

There was an excess of the lymphocytes and monocular cells. By studying the metabolism, the case was shown to be one of pernicious anemia.

One month later the conditions were found to be somewhat better. The red cells amounted to 2,175,000, the white equalled 6,760, and the hemoglobin had slightly increased (twenty-three per cent.) The condition of the red cells had not changed from that of the former examination while differential count of the leucocytes showed them to be normal.

Two months later the blood was again studied, with the following result: The red cells equalled 1,800,000, the white numbered 6,540, and the hemoglobin had risen to thirty per cent. The histological conditions of both the red and white cells remained the same as before.

Thus finding that the case failed to improve during dispensary treatment with courses of iron and bichloride of mercury, determined me to send her to the Hospital of the University of Pennsylvania for ward treatment.



SKETCH II.

Case IV.—*Fibroid phthisis of five years' duration in a thirty-eight year old white man. Pernicious anemia. Red corpuscles reduced to one-twentieth of normal, whites to one-half, and hemoglobin to twenty-five per cent. Characteristic eyegrounds of pernicious anemia. Death. Autopsy. Histological study of sections.*

On the twenty-third of February, 1897, C. B., a thirty-eight-year-old driver was admitted to Dr. Frederick A. Packard's service at the Philadelphia Hospital. The patient's mother died of senility and his father of paralysis. He stated that he had had typhoid fever and malaria. His present trouble, pulmonic cirrhosis associated with great general wasting dated back for five years.

The patient's blood count when first seen, showed but 670,000 red corpuscles with twenty-five per cent. hemoglobin. There was pronounced poikilocytosis, with both maglocytes and microcytes. No nucleated red corpuscles could be found.

The skin was of a distinct lemon color and there was myedema. The mucus membranes were pale and the tongue was white. A soft systolic murmur could be heard. The spleen was not enlarged. The knee-jerks had disappeared.

One month later the patient was noted as failing. His skin had assumed a greenish-yellow hue. There was the death color of the lips. Carotid pulsation and hemotogenous jaundice were both present.

Re-examination of the blood at this time, showed that the red corpuscles had fallen as low as 300,000, the whites to 2,500, and the hemoglobin to twenty-four per cent. Nucleated red corpuscles were present. At this time, through the courtesy of Dr. Packard and the kindness of one of my resident surgeons, Dr. J. J. Rectenwald, I was enabled to make an examination of some of the more important objective ocular symptoms. The pupils were of the same size. The irides responded equally to light-stimulus. There was a marked tremor of the orbicularis muscle of the right eye. The fields of vision, as well as could be taken, were reduced concentrically. The eyegrounds which were about the same on each side gave a picture as shown in figure 4, plate II, faithfully drawn in water-colors by Miss Washington, and illustrating the appearance of the right fundus. There was a disposition to hemorrhages into the retinae that were characteristic of both the Quinke and the

Horner types. The discs were pallid. The retinae were somewhat edematous in the naso-macular regions. The larger hemorrhages, which as a rule, were deeply seated beneath the fibre-layer of the retinae, presented both white and grayish centers, and as shown in the figure, one enveloped a portion of the right lower temporal vein. More careful study made it apparent that a few of the white areas in the hemorrhages were due to leucocytic aggregation, though the bulk of them were dependent upon tissue-degeneration.

The case died upon the sixteenth of May. The post-mortem examination made upon the following day by Drs. Packard and Rectenwald showed double chronic fibrous pneumonia with effusion in the left side from acute pleurisy. There were some gastric ecchymoses. The kidneys were normal. The spleen was somewhat enlarged. The heart was fatty and the bone marrow was slightly reddened.

Both retinae with the attached optic nerves as far as the chiasm, were removed for me by Dr. Rectenwald, and given to Dr. J. Dutton Steele, Associate in the William Pepper Laboratory of Clinical Medicine, who after preparing and cutting a series of sections for me in order to determine the existence of sacculations and ampulliform dilatations, submitted to me the following interesting and valuable report: "The posterior portion of each globe was hardened in Müller's fluid. The nerves were removed close to the eyeball, and serial sections of various segments from the globe to the foramen cut. Those stained with hematoxylon and eosin showed the vessels and connective tissue framework to be normal. Other sections were stained by the Weigert and Weigert-Pal method, and disclosed no degenerated process in the medullated fibres. Search was made for the macula before imbedding the globes, and, as far as possible, the sections were made so as to include the papilla and macular region in the same section. These sections were stained by hematoxylon and eosin, thionin, and carmine. The sclera and chorioid, on both sides, were healthy. The vessels of the chorioid were filled with blood, while those of the retinae were, for the most part, empty.

"In the right retina, there was evidence of some edema of the outer reticular layer for some distance to one side of the papilla (probably between the macula and the papilla). The fibres of this layer were pushed aside and compressed

by clear spaces and the inner and outer nuclear layers were compressed and separated.

"Numerous hemorrhages of varying size were found uniformly in the fibre layer and between the ganglion cells on the same side of the papilla as the edema. The red blood cells were unchanged and had retained their shape.

"In one section about the center of the edematous portion, there was an area that showed several swollen and varicose nerve fibres in the fibre layer. These appeared as homogeneous bodies, lying in the outer portion of the layer in the vicinity of the ganglion cells. The fibre layer was thickened and nuclear layers were compressed and pushed closer together. These bodies stained a greenish-blue with thinonin, and a yellow-red with carmine, taking the eosin stain with varying degrees of intensity.

"The blood vessels of the retina and the papilla and nuclear layers were all normal. No inflammatory process could be observed in any of the sections."

The histologic findings in this case were most interesting, especially in regard to the swollen and varicose nerve fibres in the fibre layer of the retina, which in all probability were examples of the varicose and non-medullated nerve fibres described by Uthoff and de Schweinitz, and, as pointed out by these observers, somewhat resembling swollen and degenerate ganglion cells.

Case V.—*Probable hematophilia in a Negro. Examination of blood shows pernicious anemia. Death. Gross organic changes found post-mortem. Histologic study of specimens.*

On the tenth of February, 1897, S. B., a seventy-year-old Negro was admitted to Dr. John H. Musser's and Dr. Frederick A. Packard's medical wards at the Philadelphia Hospital.

The sole history that could be elicited was that of a persistent epistaxis dating from a traumatism that had occurred several days previously.

The patient was listless and apathetic. He had diarrhea. There were several attacks of bleeding from the nostril. The only gross physical sign, which was any way certain, was a faint distant cardiac murmur.

The blood count seventeen days after his admission to the hospital showed all the vascular signs of pernicious anemia. There was a lowering of the red corpuscles to 1,008,570; the white corpuscles were about normal (5,236);

and there was but thirty-five per cent. of hemoglobulin. Eosinophiles, polynuclear leucocytes, mononuclear poikilocytes, and nucleated red corpuscles were all present.

On the fifth of March, following an attempt to inject six fluid ounces of human blood with two fluid ounces of a three per cent. solution of phosphate of soda into the cephalic vein of the right arm, dyspnea, profuse perspiration, rapid respiration, feeble pulse, and nose-bleed, followed in two hours by uncontrollable bleeding from the wound in the arm, appeared.

When I first saw him, the scleras were pearly white, and the conjunctivae were almost transparent. The left eye showed all the external evidences of an old iritis; the vision of this eye being reduced to an uncorrectible one-seventh.

The eyeground of the right eye, which could be more plainly seen than that of the fellow eye, gave a remarkable picture (figure 5, plate III, reproduction of a water-color sketch by Miss Washington). New and old hemorrhages both superficial and deeply seated with claret-tinted, tortuous and flattened veins were discernible. The currents of the retinal arteries, were, as can be seen, extremely pallid. The entire eyeground was edematous, and the nerve-head which was unusually pale, stood out in vivid contrast with the most peculiarly tinted ground. Heaps of granular matter sinking deeply into the retinal substance; degeneration-areas going through to the sclera in the papillo-macular region; and variation in the intensity of the pigment layer, all were pronouncedly visible.

A few days later the patient died. The post-mortem examination held by Dr. David Riesman, one of the Assistant Pathologists to the hospital, gave the following findings: Tuberculosis of the mesenteric and retro-peritoneal glands; bulbous emphysema of the left lung; bilateral pleural effusion; old pleuritic adhesions on the right side; echinococcus cyst in the liver ($1\frac{1}{2}$ inch by $1\frac{1}{2}$ inch in size); chronic interstitial and parenchymatous nephritis; and splenization of the bone marrow.

The globe and optic nerves, obtained by Dr. Rectenwald, were hardened in Müller's fluid, imbedded and stained by Dr. Steele as in the previous case. His report is as follows:

"The same difficulty in finding the macula was exper-

ienced here as in the other specimens, as the retinae were even more folded. The nerves were healthy and there was no degeneration of the myeline sheaths.

"The sclera and choroid were normal. The outer reticular layer of the right retina was slightly broader than normal, and suggested an edematous condition, but this was not as marked as in the first case. This change was evenly distributed on both sides of the optic disc. The papilla itself appeared normal. There were a few hemorrhages of varying size in the same region. These were in the outer and inner nuclear and outer reticular layers. The vessels and cellular elements presented no change.

"In the left retina there was a slight edema of the outer reticular layer, on both sides of the papilla, which was similar to that described in the other retinae. In the fibre layer a little to one side of the papilla (probably to the macular), the fibres were swollen and varicose. The layer was swollen to such an extent that its breadth equaled that of a normal retina, causing a projection anteriorly that must have been very noticeable in the ante-mortem examination.¹ The swelling consisted of varicose nerve fibres similar to those described in the right retina of the first case. No trace of ganglion cells were visible. On the inner periphery of the nodule, there was a small hemorrhage.² No inflammatory change could be seen in any of the sections. The inner and outer nuclear layers to the outer side of the nodule were pushed together and compressed into a narrow bridge of tissue. There were numerous hemorrhages (some of considerable size), scattered through the fibre layer in the vicinity of the varicosity.

"This varicosity, which was in all of the sections, cut through the papilla. The cup appeared healthy. The blood vessels of the retina and optic disc appeared normal."

CASE VI.—*Splenic leucocythemia in a forty-four year old Italian. Blood studies indicative of mixed or leucocytic type of leukemia. Characteristic fundus-oculi changes. Death.*

M. M.—A forty-four year old Italian laborer was admitted to the medical wards of the Philadelphia Hospital under the care of Dr. Frederick A. Packard on the four-

¹ See ophthalmoscopic description and chromo-lithograph.

² The formation was evidently an exquisite example of the varicosities described by Uthoff and de Schweinitz.

teenth of September, 1896. He stated that both of his parents were alive and well. He had been in the United States of America for five years, and with the exception of an attack of malaria two years before, he had been healthy until four months previously. At the time of the first examination he complained of general debility, constipation, failure of appetite, excessive sudorosis, epistaxis, cephalalgia, vertigo, attacks of blindness, and dullness of vision. There was no obtainable venereal history. He drank both malt liquors and spirits moderately.

Physical examination showed that there was no cardiac lesion. The liver, though possibly increased in size, seemed normal. The spleen was enormously enlarged. It extended from the mid-axillary line of the sixth rib to within one-half of an inch of the crest of the ilium, and one inch to the right of the median line a little below the umbilicus anteriorly. Posteriorly, it reached to the seventh rib and spinal column.

There was edema of the extremities with tenderness over the sternum.

A blood count made by Dr. Packard on the day after the patient's admission into the hospital showed that while the red corpuscles were reduced to 2,586,000 the whites had increased to the prodigious number of 256,844. The hemoglobin had fallen to forty-five per cent. normal. Some myelocytes were present.

Four days later a second examination was made by Dr. Packard. At this time, although the red corpuscles had slightly increased (2,960,000), it was found that the white ones had lessened to nearly one-half of the previous number. A differential study of the components of the white corpuscles showed that about twenty-eight per cent. were polynuclear in form; forty-five per cent. were mononuclear and myelocytic; fifteen per cent. was found to be composed of lymphocytes and transitional forms; while about one-half per cent were eosinophilic in type.

At this time the spleen was found to be reduced to one-half of its former size. The sternal pain had increased.

A third examination of the blood by Dr. Packard gave practically the same findings as at the previous counts, the red equaled 2,312,500; the whites 236,250, with forty per cent. of hemoglobin.

Five days later a croupous pneumonia appeared. In spite of this, although of course influencing the actual data found, Dr. Taylor, through the kindness of Dr. Packard, made a most careful analysis of the blood changes; his report exhibited the following result:

The red cells equaled but 2,995,900; the leucocytes were increased to 232,154; and the hemoglobin amounted to but forty-two per cent. The specific gravity of the blood was 1,046. Its alkalinity (v. Limbeck's method) corresponded to 0,520 Na Ho in 100 Cc of blood. The red cells were markedly altered. Poikilocytes, microcytes, and macrocytes were abundant. There were not many nucleated red cells, most all of those being normoblasts.

No red cells in nuclear division could be seen, nor were there any degenerative changes noted in the red cells. There was no albumoses nor were there any peptones in the venous blood, from which the specimens for the alkalinity and specific gravity had been derived. A differential count of the white cells gave the following figures:

Neutrophilic polymorphous cells equalled	- - - - -	42.96 per cent.	=	99570
Oxyphilic polynuclear cells amounted to	- - - - -	0.16 per cent.	=	370
Simple monocular and transitional cells equalled	- - - - -	15.15 per cent.	=	35150
Oxyphilic monocular cells amounted to	- - - - -	0.64 per cent.	=	1485
Myelocytes equalled the remarkable number of	- - - - -	38.69 per cent.	=	89760
Lymphocytes amounted to	- - - - -	1.92 per cent.	=	4455
While the degenerated cells equalled	- - - - -	0.48 per cent.	=	1115
Making a total of (bulk)				100.00 per cent. = 232000

Of these the oxyphilic polynuclear cells were not present above the maximum normal, though the lymphocytes were very slightly in excess of the normal.

There was a marked polymorphism in the white cells; the size of the nuclei; the arrangement of the nuclear chromatin; the situation of the nuclei; the amount and reactions of the protoplasm; and the quantity of neutrophilic granulations varying greatly. No white cells were seen in cell division; nor were they found to contain fat or an excess of glycogen. As the result of this study, Dr. Taylor stated that "the case belongs to the class best known as the mixed or leucocytic type of leukemia."

In seven days' time the patient died, no post-mortem examination being allowed.

The eyegrounds, as shown in chromolithograph (figure 6, plate III) of the right side from a water-color sketch by Miss Washington, was characteristic of leukemic neuroretinitis with both aggregation and degeneration changes. The orange-yellow chorioidal reflex; the pallor of the currents of the retinal veins with the flattened and somewhat opaque and tortuous condition of the vessel walls; the almost orange tint of the arterial currents with their broadened undulating and almost invisible channel walls; and the increased broadening of the light-reflexes at places; all serve to help make a typical picture. If to these peculiarities, the numerous leucocytic aggregations and the old hemorrhagic degeneration-area in the temporo-macular region with its abundant sacculations and fresh extravasation masses, are added, the eye-ground changes become almost complete.

A CONTRIBUTION TO THE STUDY OF THE DYNAMICS OF THE OCULAR MUSCLES.*

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In view of the extreme interest now centred in the physiological functions of the extrinsic ocular muscles, I determined a short while ago to institute a series of experiments in this direction, upon the eyes of absolutely healthy men, who had never had the least trouble referable to their eyes. In pursuance of this determination, I have just recently completed a careful examination into the muscular status of the eyes of one hundred soldiers of the United States army, no one of whom has ever worn glasses, or has had any symptom of real asthenopia. These men were all in rugged physical health, and, from their mode of life and the requirements of the service, furnished material as near the absolutely normal physiological state as could possibly be found. Soldiers are picked men physically, being subjected to a rigorous physical examination before enlistment, and being required also to reach a naked-eye visual acuity of $\frac{20}{20}$ in each eye, in order to secure admission into the service. Consequently, my position in the government service has placed at my disposal absolutely perfect material for conducting such a series of experiments. I have examined these men with the greatest care, and feel sure that the results obtained are absolutely reliable. I commenced this series of examinations thoroughly imbued with the ideas, which we have all imbibed from the writings of those, whom we have long been accustomed to look upon as authorities in this especial direction, expecting to find an adduction (prism convergence) for distance of from 30° to 40° , or 45° , with an abduction (prism divergence) of about 6° or 7° , and feeling almost certain that I would obtain, as a rule, a ratio between these functions of 3 to 1 (Risley), possibly a proportion of 6 or 7 to 1 (Noyes), in favor of *adduction*. These

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expectations were soon rudely shattered, and I am free to say that my experiments with the absolutely perfect material at my command have convinced me that we are wrong in our estimates upon these, and other matters, connected with the examination of the power of the extrinsic ocular muscles by means of prisms.

Before discussing this subject further, I shall give in brief detail the method of examination pursued in each case.

1. With rod, or phorometer (the former instrument being used in the first 50 cases, the latter in the last 50,) the muscular balance, or imbalance, was tested for 6 meters in both the horizontal and vertical planes, a candle flame being used as the test object, and the room being darkened.

2. The visual acuity in each eye was next tested.

3. The *abduction* (prism divergence) at 6 meters was next measured with *square prisms*, the prism—base in—being placed before *one eye*.

4. The *adduction* (prism convergence) at 6 meters was next determined, the square prism being placed before *one eye*—base of the prism *out*.

5. Sursum-duction and deorsum-duction were then measured.

6. Having secured these data for 6 meters, the phorometer was used to determine the existence, or non-existence, of heterophoria at 33 centimeters, the fine dot and line being used as test object.

7. Abduction, adduction, sursum-duction, and deorsum-duction were then measured with prisms (square) at 33 centimeters, the same fine dot and line being used as test object.

No attempt was made to discover any possible slight error of refraction.

I have recorded the results of these 100 examinations in a table, giving in addition the name, rank, company, regiment or corps, age, and visual acuity in each eye of each soldier examined. This table I have appended to my paper, and shall now simply give the results *en masse*.

We are accustomed to see it stated that while *orthophoria* is normal, and to be expected, for *distance*, an *exophoria* of about 5° is *physiological for near*.

Dr. Duane, of New York, in his last monograph on this subject, which has just issued from the press, says:

"It must be borne in mind that while orthophoria—absence of deviation—is the ideal state for distance, *a slight amount of divergence is physiological for near*. Thus in testing at 12", we expect to find with the phorometer an exophoria of 3° to 6°, * * * * *; and *orthophoria* at this range is actually to be regarded with suspicion, as probably indicating an undue tendency to convergence." Noyes states that, in testing the muscular relations for near in the horizontal plane, "It is most common to find that the images do not stand vertically above each other, but that there is a deviation in the sense of abduction of about 5°; this cannot be called abnormal. More than this must be noted." Let us now look at the results bearing upon these points obtained in the examination of my 100 non-asthenopic soldiers. For ease of reference I shall group these results.

FOR DISTANCE, 6 METERS.

Orthophoria in 60 cases.
Exophoria-simple in 6 cases.
Esophoria in 27 cases.
Hyperphoria—slight in 4 cases.
Hyper-exophoria in 2 cases.
Hyper-esophoria in 1 case.

FOR NEAR, 33 CENTIMETERS.

Orthophoria in 82 cases.
Exophoria in 15 cases.
Esophoria in 1 case.
Hyperphoria in 1 case.
Hyper-exophoria in 1 case.
Hyper-esophoria in 0 case.

This table shows that in 100 cases we may expect for *distance* orthophoria in 60 per cent. of the cases, and a slight, or very moderate, degree of heterophoria in 40 per cent. Of the 6 cases of *exophoria* the maximum error was 4°, and the minimum $\frac{1}{2}^{\circ}$. The 27 cases of *esophoria* showed a maximum of 5° in 1 case, and a minimum of $\frac{1}{2}^{\circ}$ in 5 cases. There were between these limits the following degrees of this error (*esophoria*): 1° in 10 cases; $1\frac{1}{2}^{\circ}$ in 1 case; 2° in 5 cases; $2\frac{1}{2}^{\circ}$ in 1 case; 3° in 2 cases, and 4° in 2 cases. The highest degree of hyperphoria was 2° in 1 case, the other 3 cases each showing an error of $\frac{1}{2}^{\circ}$. The two cases of *hyper-exophoria* showed 1° of hyperphoria for each, with 7° of exophoria for one, and 6° for the other. The 1 case of *hyper-esophoria* manifested $\frac{1}{2}^{\circ}$ of hyperphoria, and 2° of esophoria.

When we come to examine the indications of the phorometer for *near*, we find that, instead of there being *exophoria as the rule*, as many writers would have us believe, only 15 cases of simple exophoria were found, with 1 case of hyper-exophoria, in my whole series of 100 cases; while there were 82 cases of *perfect orthophoria*, which the authorities would have us consider abnormal. Of these 15

cases of exophoria there was an error of $\frac{1}{2}^{\circ}$ in 1 case; 1° in 1 case; 2° in 3 cases; $2\frac{1}{2}^{\circ}$ in 1 case; 3° in 1 case; $3\frac{1}{2}^{\circ}$ in 1 case; 4° in 1 case; 5° in 1 case; 7° in 1 case; 9° in 1 case; 10° in 1 case; 11° in 2 cases, and 18° in 1 case. In the 1 case of *hyper-exophoria* for near there was a *hyperphoria* of 1° , and an *exophoria* of 16° . This error occurred in a different individual from either of those who showed this error for *distance*; these latter both had *orthophoria* for near.

In view of the fact that 82 per centum of my soldiers examined showed *orthophoria* for 33 centimeters, what are we to think of the so-called rule that *exophoria is the normal state for near*? Dr. Stevens, of New York, in his latest publication in "System of Diseases of the Eye," Norris and Oliver, thus remarks upon this point: "Nothing has been said thus far of testing at near points, because tests of the state of the ocular muscles made at near points have no direct value. It may, however, in certain cases be found advantageous to ascertain the action at the reading distance as a collateral test. In the best condition of equilibrium there will generally appear exophoria in accommodation 4° or 5° , etc." From my experiments on healthy eyes, I am forced to the conclusion that *orthophoria for near is the physiological state*, notwithstanding the opposite opinion held by such eminent authorities. Then again, the occurrence of heterophoria for distance in 40 per cent. of these perfectly healthy eyes should also give us reason for thought.

My preconceived ideas on the subject of *abduction* and *adduction*, for both distance and near, received a very rude shaking, also, in consequence of the results obtained in my experiments. In January, 1895, Dr. S. D. Risley published the results of his examinations of 25 non-asthenopic individuals conducted with reference to the amounts, and relations, of *abduction* and *adduction* for distance.* This observer used a rotary prism before each eye, first rotating the prisms so as to measure *abduction*, and then making the rotation in the opposite direction to determine the *adduction*.

The average result in the 25 cases was 8.1° for *abduction*, and 25.04° for *adduction*. The highest abduction found by him was 12° in 3 cases, and the lowest 3° in 1 case; the highest *adduction* found by Dr. Risley was 36° in 3 cases, and

*See University Medical Magazine, January, 1895.

the lowest 8° in 1 case, this latter being found in the individual who possessed only 3° of *abduction* for distance. Dr. Risley's results in the way of adduction show a decidedly greater power of prism convergence for distance than I have been able to obtain in my 100 cases. It may be that the use of the rotary prism before each eye, may, by the very gradual increase of prism strength, cause a greater amount of muscular power to be brought into action than can be excited by the intermittent use of square prisms of different strengths, placed only before one eye. However that may be, the method which I have pursued is that generally followed in office examinations, and consequently will be the method most likely to be chosen by any ophthalmologist experimenting in this direction. Dr. Risley's paper gives the only series of examinations in the line of muscular dynamics that I have been able to find, but my 100 cases should furnish results of greater weight than those obtained from his 25 cases, simply on the score of numbers.

For convenience of reference I have condensed my results in the direction of *abduction* and *adduction* in the following brief tables:

<i>Abduction.</i>		<i>Distance.</i>	<i>Near.</i>
Abduction of	3°	In 3 cases.	In 0 case.
" "	4°	" 14 "	" 0 "
" "	5°	" 5 "	" 0 "
" "	6°	" 20 "	" 0 "
" "	7°	" 23 "	" 2 cases.
" "	8°	" 22 "	" 3 "
" "	9°	" 4 "	" 3 "
" "	10°	" 3 "	" 4 "
" "	11°	" 2 "	" 3 "
" "	12°	" 2 "	" 13 "
" "	13°	" 1 "	" 11 "
" "	16°	" 1 "	" 12 "
" "	17°	" 0 "	" 9 "
" "	18°	" 0 "	" 4 "
" "	19°	" 0 "	" 2 "
" "	20°	" 0 "	" 8 "
" "	21°	" 0 "	" 1 "
" "	22°	" 0 "	" 2 "
" "	25°	" 0 "	" 2 "
" "	27°	" 0 "	" 1 "

The average abduction for distance in my 100 cases is 6.88° , or 7° , virtually, as compared with Dr. Risley's average of 8.1° in 25 cases.

<i>Adduction.</i>		<i>Distance.</i>	<i>Near.</i>
Adduction of	5°	In 1 case,	In 0 case.
" "	7°	" 2 cases.	" 0 "
" "	8°	" 4 "	" 0 "
" "	9°	" 3 "	" 0 "
" "	10°	" 5 "	" 0 "
" "	11°	" 8 "	" 3 cases.

<i>Adduction.</i>	<i>Distance.</i>	<i>Near.</i>
Adduction of 12°	In 17 Cases.	In 2 Cases.
" " 13°	" 12 "	" 0 "
" " 14°	" 7 "	" 6 "
" " 15°	" 11 "	" 3 "
" " 16°	" 10 "	" 8 "
" " 17°	" 0 "	" 1 "
" " 18°	" 5 "	" 16 "
" " 19°	" 0 "	" 2 "
" " 20°	" 7 "	" 11 "
" " 21°	" 2 "	" 5 "
" " 22°	" 3 "	" 1 "
" " 23°	" 1 "	" 3 "
" " 24°	" 1 "	" 1 "
" " 25°	" 0 "	" 12 "
" " 26°	" 1 "	" 1 "
" " 28°	" 0 "	" 2 "
" " 30°	" 0 "	" 5 "
" " 31°	" 0 "	" 1 "
" " 32°	" 0 "	" 2 "
" " 38°	" 0 "	" 1 "
" " 40°	" 0 "	" 2 "
" " 50°	" 0 "	" 1 "
" " 60°	" 0 "	" 1 "
" " 80°	" 0 "	" 2 "

The average *adduction for distance* is 14.1° in my series, as compared with 25.04° in Dr. Risley's series of 25 cases. Dr. Stevens says, "The ability to blend images of an object at a similar distance when prisms with the bases out are used (adduction) should be about 50° (prism), but this ability may be so greatly modified by practice that an exact standard of adduction is not to be expected. Yet, should the adducting ability fail to reach 50° after a reasonable amount of practice, it is likely to be deficient."*

By referring to my condensed tabulated statement, it can be seen that the lowest *abduction* for distance reached was 3° in 3 cases, and the highest 16° in 1 case. There was, furthermore, an abduction of 4° in 14 cases, and of 5° in 5 cases, making 22 cases in my series with an *abduction* falling below 6°. Noyes states that the abduction for distance should not fall below 6°, and that an abduction of "less than 5° will in most cases be pathological."† According to Duane, "For distance, *i. e.*, when the visual lines are parallel, the divergence amounts quite regularly to from 3° to 5° (= divergence produced in overcoming a prism of 6° or 10°); and variations above or below these limits must be regarded as distinctly pathological."‡

If these views are correct 22, or at least 17, of my abso-

* See "System of Diseases of the Eye."—Norris and Oliver, pages 179 and 180.

† See "Diseases of the Eye."—Noyes, pages 193 and 194.

‡ See "Motor Anomalies of the Eye."—Duane, page 25.

lutely healthy cases would fall in the *pathological class*! It was, however, in connection with *adduction* (prism convergence) for distance that my former ideas received the most severe shock. I am perfectly willing to place myself upon record as asserting that the teaching of the "authorities," that healthy eyes should show, upon demand, *a prism convergence for distance of 30°, or 35°, to 50°*, is absolutely misleading, and erroneous. In my series of examinations, the highest amount of adduction for 6 meters reached was 26°, and this amount could only be obtained in *one case*, and that, too, only after most careful effort. In only 14 cases was the adduction for distance above 18°, and in the remaining 86 cases it was from 18° down to 5°, the greatest number for any one degree being *17 cases* with an *adduction of 12°*. Of course, I am well aware that by gradual practice with prisms most, if not all, of these cases could be made to exhibit a prism convergence for 6 meters of at least 50°. I would guarantee by Gould's method to bring every one up to this amount; but that is not the point at issue. We are told that in our office consultations our patients should show this amount of adduction (30° or 35°, to 45° or 50°), and that if they do not exhibit it, *we must consider their convergence to be weak*. If we accept as true the standard given above, *every one of my 100 healthy cases should be charged with convergence insufficiency*, for only one of the entire number was able to reach even the decidedly lower standard proposed by Dr. Risley, this man having a prism convergence for distance of 26°. The ability of any individual to overcome adductive prisms, *without previous practice*, is no accurate measure of his power of convergence. A prism, base out, causes the eyes while looking at an object at any given distance, say 20 feet, to *converge as if the object was within this distance*. The power to perform this ocular feat increases with practice, so that after a variable time the adduction, as measured with prisms, can be made to gain in degree in an astonishing manner. The test of the convergence by means of prisms, therefore, is too unreliable for scientific work, since it furnishes a *sliding* standard, whereas we require a *fixed* one. The same objection does not apply to the examination of the abduction, for, as Dr. Duane well says, "In the great majority of cases, at least, the *diverging power, as measured by the ability to overcome prisms, base in, cannot be increased at all beyond the initial amount*

shown by the subject experimented upon. If, for example, in our first trial of a patient, the maximum prism, base in, that he can overcome is one of 8° , we shall generally find that we cannot get him beyond this point by any amount of training."

It will be interesting at this point of the discussion of my subject, to observe the indications of the phorometer in the cases of abduction, of degrees usually considered below and above the normal, in connection with the adduction in each case. I shall, therefore, omit the cases showing an abduction for 6 meters, of 6° , 7° , and 8° , and shall condense the remainder, usually considered to have an abnormal amount of abduction in either direction, in a tabulated statement.

In this statement I shall commence with the lowest degree of *abduction* and, opposite each case, I shall give its number in the general table, so that it can be easily referred to.

CASE.	Abduction of 3° for 6 meters—3 cases.					
14.	For <i>dist.</i> , esoph.	$= 1^\circ$	For <i>near</i> , ortho.	Adduc. for 6M	$= 10^\circ$	
60.	" esoph.	$= 1\frac{1}{2}^\circ$	" ortho.	" "	" 14°	
67.	" ortho.		" ortho.	" "	" 7°	

CASE.	Abduction of 4° for 6 Meters—14 Cases.					
4.	For <i>dist.</i> , exoph.	$= 3^\circ$	For <i>near</i> , ortho.	Adduc. for 6M	$= 18^\circ$	
13.	" esoph.	$= 2^\circ$	" ortho.	" "	" 18°	
15.	" ortho.		" ortho.	" "	" 13°	
22.	" esoph.	$= 1^\circ$	" ortho.	" "	" 16°	
36.	" esoph.	$= 1\frac{1}{2}^\circ$	" ortho.	" "	" 10°	
44.	" esoph.	$= 2\frac{1}{2}^\circ$	" ortho.	" "	" 12°	
54.	" ortho.		" ortho.	" "	" 20°	
58.	" ortho.		" ortho.	" "	" 21°	
71.	" ortho.		" ortho.	" "	" 10°	
76.	" ortho.		" ortho.	" "	" 15°	
82.	" esoph.	$= 3^\circ$	" ortho.	" "	" 20°	
91.	" ortho.		" ortho.	" "	" 11°	
97.	" ortho.		" ortho.	" "	" 12°	
98.	" esoph.	$= 1\frac{1}{2}^\circ$	" ortho.	" "	" 18°	

CASE.	Abduction of 5° for 6 Meters—5 Cases.					
9.	For <i>dist.</i> , hyperph.	$= 2^\circ$	For <i>near</i> , ortho.	Adduc. for 6M	$= 22^\circ$	
35.	" esoph.	$= 1^\circ$	" ortho.	" "	" 12°	
49.	" ortho.		" ortho.	" "	" 11°	
65.	" ortho.		" ortho.	" "	" 13°	
93.	" ortho.		" ortho.	" "	" 8°	

CASE.	Abduction of 9° for 6 Meters—4 Cases.					
10.	For <i>dist.</i> , esoph.	$= 3^\circ$	For <i>near</i> , ortho.	Adduc. for 6M	$= 20^\circ$	
33.	" ortho.		" ortho.	" "	" 18°	
73.	" ortho.		" exoph.	$= 2^\circ$	" 15°	
83.	" ortho.		" ortho.	" "	" 13°	

CASE.	Abduction of 10° for 6 Meters—3 Cases.					
34.	For <i>dist.</i> , ortho.		For <i>near</i> , ortho.	Adduc. for 6M	$= 12^\circ$	
72.	" exoph.	$= 1\frac{1}{2}^\circ$	" exoph.	$= 3^\circ$	" 13°	
79.	" ortho.		" ortho.	" "	" 12°	

CASE. Abduction of 11° for 6 Meters—2 Cases.
 57. For "*dist.*, exopho. = $3\frac{1}{2}^\circ$. For "*near*, ortho. Adduc. for 6M = 7°
 85. ortho. ortho. " " " 14°

CASE, Abduction of 12° for 6 Meters—2 Cases.
 32. For "*dist.*, ortho. For "*near*, ortho. Adduc. for 6M = 12°
 45. ortho. ortho. " " " 15°

CASE. Abduction of 13° for 6 Meters—1 Case.
 12. For "*dist.*, esopho. = 2° . For "*near*, ortho. Adduc. for 6M = 14°

CASE. Abduction of 16° for 6 Meters—1 Case.
 63. For "*dist.*, ortho. For "*near*, ortho. Adduc. for 6M = 26°
 The case is interesting as furnishing at the same time the highest degree of *abduction*, as well as of *adduction*, obtained in my series.

Referring to the cases showing an *abduction* for distance of 3° , 4° , and 5° , as given in the preceding tabulated statement, which cases according to the commonly accepted views should be placed in the pathological class, it is interesting to note the indications of the phorometer. Out of these 22 cases there were only 9 cases of *esophoria* for distance, the highest amount of this error being 3° in 1 case, this latter degree occurring in an individual who possessed 4° of *abduction*. All of these 22 cases exhibited *orthophoria* for *near*. In looking into the records of the cases showing an *abduction* erring in the direction of excess, *i. e.*, from 9° to 16° . we find in all, 13 cases. Four of these individuals showed the existence of slight heterophoria for distance, 2 being cases of *esophoria*, and 2 manifesting *exophoria*. The degrees of *esophoria* were respectively 3° (with abduction of 9°), and 2° (with abduction of 13°), and the amounts of *exophoria* $3\frac{1}{2}^\circ$ (with abduction of 11°), and $1\frac{1}{2}^\circ$ (with abduction of 10°). There were only 2 cases of *exophoria for near*, showing 2° and 3° respectively, the first amount of error occurring with a distance abduction of 9° , and the second with an abduction of 10° . If *exophoria for near* is the rule in normal eyes, with the amount of abduction for distance usually considered normal, should we not in these 13 cases, with an increased abduction, expect to find a *most emphatic manifestation of divergence for near*? How is it then that out of these cases we find 11 instances of *orthophoria* for 33 centimeters, and only 2 instances of such a trivial tendency to *exophoria* (2° and 3°)?

The only answer to this question, especially in view of the fact that 82 of my 100 cases showed *orthophoria* for 33 centimeters, is this: *Orthophoria is the physiological state for near.*

As regards the ratio of *adduction to abduction*, I do not believe that we can establish *any inflexible rule* for the examination with prisms, and require our patients to conform to it, *without previous training in prism gymnastics*. I am certain that the ratio for healthy eyes of "6 to 1, or 7 to 1, not permitting abduction to go below 6°" (Noyes) cannot be realized in our office examinations, without previous training of the convergence with prisms.

In the matter of *sursum-duction and deorsum-duction* I find, from my general table, that in 70 cases both of these functions reached 2°; in 1 case sursum-duction was 2°, and deorsum-duction varied slightly, while in 3 cases deorsum-duction was 2°, and sursum-duction was slightly different. In 71 cases sursum-duction and deorsum-duction were the same for both *distance and near*; in 29 cases there was a slight degree of difference between these findings. The highest degree of sursum-duction and deorsum-duction found for distance was 8° for each in the same case. This individual showed both of these functions to be 12° at 33 centimeters, there being in his case orthophoria for both distance and near.

In 70 per cent. of cases of healthy eyes we may expect, therefore, a sursum-duction and deorsum-duction each of 2°. It seems well settled, also, from my experiments, that the power in each direction of the vertical plane is *about the same*, and that *deorsum-duction should not be expected to exceed the antagonistic function as held by some*.

I come, now, to a most interesting point in connection with muscular dynamics, to-wit: The *amplitude of convergence*, as determined by the method of Landolt, *in comparison with the prism convergence*.

In the last 30 cases of my series, I made it a point to determine the *amplitude of convergence* after Landolt's method, only instead of using the ophthalmo-dynamometer, I made use of a fine line and dot, keeping this test object exactly in the middle line, and bringing it gradually closer and closer to the eyes, stopping as soon as the line, or dot, exhibited the least broadening, or doubling, and measuring the distance of this point from the eyes as the *punctum proximum of convergence*. The *punctum remotum of convergence* was secured from the prism abduction for 6 meters. Having the punctum remotum and punctum proximum of convergence, it was very simple to calculate the amplitude of convergence in *metre angles*.

I shall give here a table showing the number of each case in the general table, and giving the prism abduction for distance, the prism adduction for both distance and near, the maximum of convergence, the minimum of convergence, and the amplitude of convergence, the last three functions being expressed in metre-angles.

Table Showing Relation of Prism Convergence to Amplitude of Convergence.

Case number in general table.	Abduction for 6 M.	Adduction for 6 M.	Adduction for 33 Cm.	Maximum of convergence.	Minimum of convergence.	Amplitude of convergence.
71	4°	10°	18°	11.80 M. A.	0.60 M. A.	12.40 M. A.
72	10	13	16	13.80 M. A.	1.40 M. A.	15.20 M. A.
73	9	15	21	16.66 M. A.	1.28 M. A.	17.94 M. A.
74	6	11	16	13.80 M. A.	0.85 M. A.	14.65 M. A.
75	7	12	14	20.00 M. A.	1.00 M. A.	21.00 M. A.
76	4	15	18	16.66 M. A.	0.60 M. A.	17.26 M. A.
77	6	13	25	16.66 M. A.	0.85 M. A.	17.51 M. A.
78	7	11	16	11.80 M. A.	1.00 M. A.	12.80 M. A.
79	10	12	20	16.66 M. A.	1.40 M. A.	18.06 M. A.
80	8	15	18	13.80 M. A.	1.14 M. A.	14.94 M. A.
81	7	10	18	16.66 M. A.	1.00 M. A.	17.66 M. A.
82	4	20	20	20.00 M. A.	0.60 M. A.	20.60 M. A.
83	9	13	18	13.80 M. A.	1.28 M. A.	15.08 M. A.
84	7	5	14	13.80 M. A.	1.00 M. A.	14.80 M. A.
85	11	14	26	16.66 M. A.	1.60 M. A.	18.26 M. A.
86	8	24	27	17.80 M. A.	1.14 M. A.	18.94 M. A.
87	6	8	18	16.66 M. A.	0.85 M. A.	17.51 M. A.
88	7	12	18	13.80 M. A.	1.00 M. A.	14.80 M. A.
89	8	12	32	16.66 M. A.	1.14 M. A.	17.80 M. A.
90	8	15	16	8.00 M. A.	1.14 M. A.	9.14 M. A.
91	4	11	27	13.80 M. A.	0.60 M. A.	14.40 M. A.
92	8	12	11	16.66 M. A.	1.14 M. A.	17.80 M. A.
93	5	8	18	16.66 M. A.	0.70 M. A.	17.36 M. A.
94	7	20	50	16.66 M. A.	1.00 M. A.	17.66 M. A.
95	8	8	14	8.00 M. A.	1.14 M. A.	9.14 M. A.
96	6	11	9	5.33 M. A.	0.85 M. A.	6.18 M. A.
97	4	12	9	11.43 M. A.	0.60 M. A.	12.03 M. A.
98	4	18	80	17.80 M. A.	0.60 M. A.	13.40 M. A.
99	8	14	20	20.00 M. A.	1.14 M. A.	21.14 M. A.
100	8	12	30	13.80 M. A.	1.14 M. A.	14.94 M. A.

Landolt says:* "We have found that, in the normal state, the maximum of convergence is, on an average, $p = 9.5$ m. a.; the minimum $r = -1$ m. a., therefore the average amplitude of convergence—

$$a = 9.5 - (-1) = 10.5 \text{ m. a.}$$

But it often happens that the maximum rises to 15 *ma* and more."

From the table given above it can be seen that in only 3 cases out of the 30 examined in this manner, did the am-

*See 'Refraction and Accommodation of the Eye.'—Landolt page194.

plitude of convergence fall below 10.50 *ma*, Landolt's standard of a sufficiency for satisfactory work. In the other 27 cases it was well above this standard, though the prism convergence, both for *distance* and *near*, was low, as a rule, judging it by the commonly accepted ideas on this subject. In the face of such discrepancy, there can be only one opinion, namely, *that the prism convergence obtained by the usual method of office examination, is unreliable and misleading, and no proper measure of the real power of convergence.*

Conclusions—As the result of my experiments upon the subject of the dynamics of the ocular muscles, I shall formulate the following conclusions:

1. The degree of *adduction* (prism convergence) given by most writers as proper for 6 meters, *cannot be reached by healthy eyes except after practice in the use of prisms.* Hence the standard is too high for attainment in the first office examination, and hence the method of *measuring the convergence by adductive prisms is unreliable and misleading.*

2. That the *prism convergence for near* (33 centimeters) is also misleading, and is not an accurate test of the real power of convergence.

3. That the determination of the *punctum proximum of convergence*, and the calculation of the *maximum convergence* after the method of Landolt, are the only true tests of the real power of convergence, or the positive convergence.

4. That contrary to the generally received views, *abduction* (prism divergence) for distance can fall well below 6° in healthy eyes, and that, consequently, *it is wrong to assume, upon this basis alone, that such cases are pathological.*

5. That there exists in healthy eyes no positive, definite relation between *prism convergence* and *prism divergence* for distance, and that it is not correct to claim that such eyes should *without practice with prisms*, show at 6 meters a ratio between these functions of 3 to 1, or 7 to 1, in favor of convergence, not permitting abduction to fall below 6°.

6. That we may expect *sursum-duction* and *deorsum-duction*, for distance, to be about the same in degree; in about 70 per cent. of healthy eyes each function reaches 2°, (prism) in amount.

7. That in healthy eyes, *orthophoria* exists in about 60 per cent. of the cases *for distance*, and in about 82 per cent. *for near*, and that *it is wrong to hold that orthophoria for near is abnormal, and to be viewed with suspicion.*

8. That in about 40 per cent. of *healthy individuals*, who have never had a symptom of eye trouble, there may be found a slight *heterophoria for distance*, and that, therefore, we should not assume that *every patient* showing a slight degree of imbalance is, on that account alone, in a serious condition.

TABLE OF GENERAL RESULTS.

DISTANCE (6 M).								NEAR (33 CM).				
Number.	Age.	Rod and phoro-meter.	Vision.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.	Phorometer.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.
1	40	O.	O. D. = 20-20 O. S. = 20-20	7°	13°	2°	2°	Ex. 7°.	8°	21°	2°	2°
2	27	O.	O. D. = 20-20 O. S. = 20-20	6	13	3	3	Ex. 5°.	10	18	3	3
3	27	Es. 1°	O. D. = 20-20 O. S. = 20-20	7	13	2	2	Ex. 1°.	13	25	2	2
4	29	Ex. 3°	O. D. = 20-20 O. S. = 20-20	4	18	2	2	O.	16	25	2	2
5	24	O.	O. D. = 20-20 O. S. = 20-20	8	14	2	2	O.	16	80	2	2
6	24	Es. 1°	O. D. = 20-20 O. S. = 20-20	8	14	2	2	O.	14	16	2	2
7	23	O.	O. D. = 20-20 O. S. = 20-20	6	11	2	2	Ex. 3½°.	9	18	2	2
8	34	Es. 2°	O. D. = 20-20 O. S. = 20-20	6	12	2	2	Ex. 2°.	12	14	2	2
9	27	H. 2°	O. D. = 20-20 O. S. = 20-20	5	22	2	2	O.	12	23	2	2
10	24	Es. 3°	O. D. = 20-20 O. S. = 20-20	9	20	3	3	O.	20	25	4	4
11	35	Ex. 1°	O. D. = 20-20 O. S. = 20-20	7	16	2	2	O.	11	25	2	2
12	25	Es. 2°	O. D. = 20-20 O. S. = 20-20	13	14	5	5	O.	14	23	5	5
13	22	Es. 2°	O. D. = 20-30 O. S. = 20-30	4	18	2	2	O.	14	40	3	3
14	31	Es. 1°	O. D. = 20-20 O. S. = 20-20	3	10	2	2	O.	7	20	3	3
15	23	O.	O. D. = 20-20 O. S. = 20-20	4	13	2	2	O.	14	18	2	2
16	36	Es. 2°	O. D. = 20-20 O. S. = 20-20	8	16	2	2	O.	18	31	2	2
17	32	O.	O. D. = 20-20 O. S. = 20-20	6	16	2	2	O.	17	21	2	2
18	31	O.	O. D. = 20-20 O. S. = 20-20	8	12	2	2	O.	12	20	2	2
19	23	Es. 2°	O. D. = 20-20 O. S. = 20-20	7	9	2	2	O.	13	21	2	2
20	30	Es. 4°	O. D. = 20-20 O. S. = 20-20	8	16	2	2	O.	16	25	2	2
21	27	{ R.H. 1° Ex. 7°	O. D. = 20-20 O. S. = 20-20	8	13	1½	1	O.	16	18	2	1
22	22	Es. 1°	O. D. = 20-20 O. S. = 20-20	4	16	2	2	O.	15	28	2	2
23	27	Es. ½°	O. D. = 20-20 O. S. = 20-20	8	11	2	2	O.	12	25	2	2
24	27	Ex. ½°	O. D. = 20-20 O. S. = 20-20	7	16	2	2	Ex. 2½°.	20	23	2	
25	22	Es. ½°	O. D. = 20-20 O. S. = 20-20	6	13	2	2	O.	15	16	3	

TABLE OF GENERAL RESULTS.—CONTINUED.

DISTANCE (6 M.).								NEAR (33 CM.).				
Number.	Age.	Rod and phoro- meter.	Vision.	Abduction,	Adduction.	Sursum-duction.	Deorsum-duction.	Phorometer.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.
26	25	O.	O. D. = 20-20 O. S. = 20-20	8°	13°	2°	2°	O.	14°	20°	2°	2°
27	35	Es. 1°	O. D. = 20-30 O. S. = 20-30	8	22	2	2	O.	18	25	2	2
28	26	Es. 4°	O. D. = 20-20 O. S. = 20-20	7	14	2	2	O.	20	21	2	2
29	24	O.	O. D. = 20-20 O. S. = 20-20	7	20	3	3	Ex. 4°	20	18	4	3
30	29	O.	O. D. = 20-20 O. S. = 20-20	7	16	2	2	O.	16	25	2	2
31	27	O.	O. D. = 20-20 O. S. = 20-20	8	12	2	2	O.	11	20	2	2
32	21	O.	O. D. = 20-20 O. S. = 20-20	12	12	4½	4½	O.	27	32	4	4½
33	21	O.	O. D. = 20-30 O. S. = 20-30	9	18	2	2	O.	15	18	2	2
34	26	O.	O. D. = 20-20 O. S. = 20-20	10	12	4	4	O.	22	25	5	5
35	22	Es. 1°	O. D. = 20-10 O. S. = 20-10	5	12	2	2	O.	8	16	3	3
36	23	Es. ½°	O. D. = 20-20 O. S. = 20-20	4	10	2	2	O.	14	14	2	2
37	43	Es. 5°	O. D. = 20-50 O. S. = 20-50	6	23	2	2	O.	9	30	3	3
38	24	H. ½°	O. D. = 20-30 O. S. = 20-30	6	15	2	2	O.	13	15	2	2
39	28	O.	O. D. = 20-30 O. S. = 20-30	6	8	2	2	O.	12	14	2	2
40	33	O.	O. D. = 20-30 O. S. = 20-30	7	15	2	2	O.	16	27	2	2
41	25	O.	O. D. = 20-20 O. S. = 20-20	6	16	2	2	O.	15	24	2	2
42	32	{ Es. 2° H. ½°	O. D. = 20-30 O. S. = 20-30	6	18	2	2	O.	14	20	2	2
43	43	O.	O. D. = 20-20 O. S. = 20-20	7	12	3	3	O.	14	15	3	3
44	33	Es. 2½°	O. D. = 20-30 O. S. = 20-30	4	12	2	2	O.	10	16	2	2
45	27	O.	O. D. = 20-20 O. S. = 20-20	12	15	2	2	O.	13	18	2	2
46	33	O.	O. D. = 20-30 O. S. = 20-30	6	16	2	2	O.	12	30	2	2
47	37	O.	O. D. = 20-20 O. S. = 20-20	7	12	2	2	O.	15	27	2	2
48	28	O.	O. D. = 20-20 O. S. = 20-30	6	12	2	2	O.	15	15	2	2
49	32	O.	O. D. = 20-20 O. S. = 20-20	5	11	2	2	O.	16	22	2	2
50	30	{ H. 1° Ex. 6°	O. D. = 20-30 O. S. = 20-20	8	9	2	2	Es. 18°.	18	9	2	2

TABLE OF GENERAL RESULTS.—CONTINUED.

DISTANCE (6 M.).								NEAR (33 CM.).				
Number.	Age.	Rod and phorometer.	Vision.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.	Phorometer.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.
51	33	Es. 1°	O. D. = 20-30 O. S. = 20-30	7°	18°	2°	2°	Es. 11°	13°	40°	2°	2°
52	40	O.	O. D. = 20-30 O. S. = 20-30	8	22	2	2	O.	9	25	2	2
53	27	O.	O. D. = 20-20 O. S. = 20-20	6	10	3	3	O.	17	20	4	4
54	39	O.	O. D. = 20-40 O. S. = 20-30	4	20	2	2	O.	12	27	2	2
55	29	O.	O. D. = 20-20 O. S. = 20-20	7	21	2	2	O.	14	28	3	3
56	26	O.	O. D. = 20-20 O. S. = 20-20	6	11	1½	1½	O.	19	17	2	2
57	27	Ex. 3½°	O. D. = 20-20 O. S. = 20-20	11	7	4	4	O.	20	11	2	2
58	25	O.	O. D. = 20-30 O. S. = 20-30	4	21	2	2	O.	13	38	2	2
59	23	O.	O. D. = 20-20 O. S. = 20-20	6	16	2	2	Ex. 2°	16	18	2	2
60	31	Es. 1½°	O. D. = 20-30 O. S. = 20-20	3	14	2	2	O.	13	11	1½	1½
61	23	O.	O. D. = 20-20 O. S. = 20-20	7	20	2	2	O.	10	20	2	2
62	23	O.	O. D. = 20-20 O. S. = 20-20	7	13	2	2	O.	20	25	2	2
63	27	O.	O. D. = 20-20 O. S. = 20-20	16	26	8	8	O.	25	60	12	12
64	28	O.	O. D. = 20-20 O. S. = 20-20	6	20	2	2	O.	13	30	3	3
65	34	O.	O. D. = 20-20 O. S. = 20-20	5	13	2	2	O.	13	12	2	2
66	25	O.	O. D. = 20-20 O. S. = 20-20	7	15	2	2	O.	12	12	2	2
67	24	O.	O. D. = 20-20 O. S. = 20-20	3	7	2	2	O.	17	30	2	2
68	23	O.	O. D. = 20-20 O. S. = 20-20	8	15	2	2	O.	14	19	2	2
69	23	O.	O. D. = 20-20 O. S. = 20-20	8	15	2	2	Es. 1½°	12	20	2	2
70	23	Ex. 4°	O. D. = 20-30 O. S. = 20-20	7	15	2	2	Ex. 11°	17	19	2	2
71	28	O.	O. D. = 20-20 O. S. = 20-20	4	10	2	2	O.	20	18	2	2
72	34	Es. 1½°	O. D. = 20-20 O. S. = 20-20	10	13	3	3	Ex. 3°	16	16	3	3
73	17	O.	O. D. = 20-20 O. S. = 20-20	9	15	2	2	Ex. 2°	20	21	2	2
74	33	O.	O. D. = 20-20 O. S. = 20-20	6	11	2	2	Ex. 10°	11	16	2	2
75	22	O.	O. D. = 20-20 O. S. = 20-20	7	12	2	2	O.	10	14	2	2

TABLE OF GENERAL RESULTS.—CONTINUED.

DISTANCE (6 M.).								NEAR (33 CM.).				
Number.	Age.	Rod and phoro-meter.	Vision.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.	Phorometer.	Abduction.	Adduction.	Sursum-duction.	Deorsum-duction.
76	28	O.	O. D. = 20-20 O. S. = 20-20	4°	15°	2°	2°	O.	12°	18°	2°	2°
77	21	O.	O. D. = 20-20 O. S. = 20-20	6	13	1½	1½	O.	8	25	1½	1½
78	26	Es. 1°	O. D. = 20-20 O. S. = 20-20	7	11	2	2	H. 1°	13	16	2½	2½
79	28	O.	O. D. = 20-20 O. S. = 20-20	10	12	2	2	O.	17	20	2	2
80	37	Es. ½°	O. D. = 20-20 O. S. = 20-20	8	15	3	3	O.	19	18	2	2
81	22	Es. 1°	O. D. = 20-20 O. S. = 20-20	7	10	4	4	O.	16	18	4	4
82	25	Es. 3°	O. D. = 20-20 O. S. = 20-20	4	20	2	2	O.	14	20	2	2
83	30	O.	O. D. = 20-20 O. S. = 20-20	9	13	3	3	O.	17	18	3	3
84	30	Es. 1°	O. D. = 20-20 O. S. = 20-30	7	5	4	4	Ex. 9°	15	14	4	4
85	17	O.	O. D. = 20-20 O. S. = 20-20	11	14	2½	2½	O.	13	26	2½	2½
86	21	O.	O. D. = 20-20 O. S. = 20-20	8	24	3	3	O.	14	27	3	3
87	22	O.	O. D. = 20-20 O. S. = 20-20	6	8	2½	2	O.	17	18	2½	2½
88	29	H. ½°	O. D. = 20-30 O. S. = 20-30	7	12	2	2	O.	17	18	2	2
89	40	O.	O. D. = 20-30 O. S. = 20-30	8	12	2½	2½	O.	16	32	2½	2
90	30	H. ½°	O. D. = 20-20 O. S. = 20-20	8	15	2½	2	{ Ex. 16° H. 1°	25	16	2	2
91	24	O.	O. D. = 20-20 O. S. = 20-20	4	11	1½	1½	O.	12	27	2	2
92	24	O.	O. D. = 20-20 O. S. = 20-20	8	12	2	2	O.	14	11	2	2
93	24	O.	O. D. = 20-20 O. S. = 20-20	5	8	2½	2½	O.	7	18	2½	2½
94	23	O.	O. D. = 20-30 O. S. = 20-20	7	20	2	2	O.	16	50	2	2
95	23	O.	O. D. = 20-20 O. S. = 20-20	8	8	4	4	O.	12	14	2	2
96	31	O.	O. D. = 20-20 O. S. = 20-20	6	11	2	1½	O.	21	9	2	2
97	30	O.	O. D. = 20-20 O. S. = 20-20	4	12	1½	1½	O.	17	9	2	2
98	23	Es. ½°	O. D. = 20-20 O. S. = 20-20	4	18	2	2	O.	12	80	2	2
99	30	O.	O. D. = 20-30 O. S. = 20-30	8	14	2½	2	O.	22	20	2½	2½
100	25	O.	O. D. = 20-20 O. S. = 20-20	8	12	1½	1½	O.	18	30	1½	1½

Abbreviations: O., orthophoria—H., hyperphoria—Ex., exophoria—Es., esophoria.

A CASE OF TOTAL AND COMPLETE UNILATERAL OPHTHALMOPLÉGIA (INTERNAL AND EXTERNAL).*

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ILLUSTRATED.

As is well known the ocular muscles may be paralyzed in various combinations. These combined palsies have in recent years been made the subject of very exact study, until now we may claim to be in a position to recognize with accuracy their significance; as far, at least, as their localizing value is concerned. The credit is usually given to Hutchinson for first describing accurately, and naming, one of the commonest types of combined ocular palsy. In 1879 he called attention to a form of paralysis which he called ophthalmoplegia or symmetrical paralysis of the ocular muscles. Hutchinson, by this term, meant to describe a condition in which all the extrinsic muscles of the eye are paralyzed, but in which as a rule the interior muscles, *i. e.*, the iris and ciliary muscles escape. This type of combined ocular palsy usually occurs, according to Hutchinson, in patients who have had syphilis many years before or who have inherited syphilis. He recognizes, however, that it occasionally occurs without known cause. It varies somewhat in extent and degree. Thus all the muscles of both orbits may not be involved, or may not be equally affected. The disease, however, is often progressive so that a case which at one time is partial and

*This case is referred to, and the patient's photograph published, in the writer's article on "Diseases of the Cerebro-Spinal and Sympathetic Nerves" in the *Twentieth Century Practice of Medicine*, Vol. XI, p. 143. It is used in that work to illustrate paralysis of the Third Nerve. At the time the photograph was taken the paralysis of the third nerve was the only prominent symptom. Later, however, and after the photograph was published in the *Twentieth Century Practice*, the other nerves of the orbit became involved. This fact, together with the fact that an autopsy was obtained, seems to justify a full and final report of the case. For permission to use the illustration again acknowledgments are due to the publishers, Wm. Wood & Co., of New York.

incomplete may eventually become total and complete. This type, moreover, be it observed, does not, as a rule, involve the interior muscles of the eyeballs, although as to this point there are varying opinions. It is possible that there is no fixed rule about it, and that in many cases the lesion, which is nuclear, eventually extends far enough forward in the mid brain nuclei of the third nerve to involve the most anterior of these nuclei, which lie practically in the wall of the third ventricle, and preside, as is well known, over the iris and ciliary muscles.*

To gain at one and the same time both an analytical and comprehensive view of this subject it is well to resort to classification. Brissaud has suggested the following classification, which apparently covers the ground satisfactorially:

Ophthalmoplegia may be first, total and complete; second, total and incomplete; third, partial and complete; fourth, partial and incomplete.

(1) Ophthalmoplegia is total and complete when all the muscles of the eyes (supplied by the third, fourth and sixth nerves) are paralyzed, and when this paralysis is absolute in degree.

(2) It is total and incomplete when all the muscles are involved but the paralysis is not absolute, *i. e.*, some muscles still retain some power of movement.

(3) It is partial and complete when some but not all the muscles are involved, but the paralysis in the affected muscles is absolute.

(4) It is both partial and incomplete when some only of the muscles are involved and these are not absolutely paralyzed, *i. e.*, their function is not entirely abolished.

In addition to the above classification it is sometimes necessary to distinguish ophthalmoplegia externa and interna, and to indicate whether the affection is bilateral or unilateral. With these distinctions the above classification covers all possible forms of ophthalmoplegia.

In cases in which an individual nerve trunk (as the third or the sixth) is alone involved, it is best to designate the resulting ophthalmoplegia simply as a paralysis of that particular nerve. In such a case the affection is never a total ophthalmoplegia, although the paralysis may be complete.

* I have followed the same plan in this paper, even with the same words used in places, that I used in my article already referred to in the Twentieth Century Practice.

The localizing value of these various forms of ophthalmoplegia may be briefly stated.

Bilateral, total and complete ophthalmoplegia indicates a nuclear lesion. This may be a destructive lesion within the nuclei or primarily a neoplasm in their neighborhood—as for instance, a tumor of the cerebellum compressing the mid-brain.

Bilateral partial and complete ophthalmoplegia would probably indicate, not a nuclear lesion, but one at the base of the brain, so situated as to involve one or more nerve trunks (as for instance, the third and fourth) and to allow the sixth nerve to escape. Such a lesion might be supposed in or near the interpeduncular space. If a lesion causing such symptoms were nuclear we must suppose that it had completely destroyed some nuclei and completely ignored others—a not impossible but a rare chance.

Bilateral, total and incomplete ophthalmoplegia would indicate probably a nuclear lesion which had invaded all the nuclei but at the time of observation had not entirely destroyed them.

Bilateral, partial and incomplete ophthalmoplegia might also indicate a commencing nuclear lesion, but it is possible to suppose that it might be caused by symmetrical lesions in the trunks of the sixth or the third nerves—as for instance, in the bilateral paralysis, occasionally seen, of these nerves. The fact that such a paralysis, however, was incomplete, *i. e.*, that the affected muscles were only partially and not entirely paralyzed, would be a little against the lesion being in the nerve-trunks.

In cases in which the ophthalmoplegia is strictly confined to the exterior muscles of both eyes the inference is that the lesion is nuclear but that the most anterior nuclei of the third nerve, *i. e.*, those that are situated in the walls of the third ventricle, and preside over the iris and ciliary muscle have escaped. In such a case it is always possible that in time these muscles will be involved and the paralysis become total.

An unilateral ophthalmoplegia, whether total or partial, complete or incomplete, gives the case a somewhat different aspect. If the third nerve alone is involved, and associated with a crossed hemiplegia, the case presents the well known 'syndrome of Weber' and the inference is that there is an unilateral lesion of the mid brain. Such a case I

have reported—in which a tumor involved one-half of the mesencephalon. But a total and complete unilateral ophthalmoplegia points unerringly to a lesion that involves all three of the motor nerves of the orbit. This could scarcely be nuclear, hence it must naturally be in or just behind the orbit. This inference is, of course, confirmed if any of the sensory branches of the fifth nerve are implicated.

In the case which I report this evening the ophthalmoplegia was strictly unilateral and was complete and total both the exterior and interior muscles of the eye. In



addition there was a paralysis of almost all the branches of the ophthalmic division of the fifth nerve and of some of those of the superior maxillary division, while the inferior maxillary was entirely exempt.

G. R.—Aged 38, was admitted to Blockley on June 6, 1897, suffering with what at first appeared to be simply a paralysis of the third nerve. Later, however, it was found that he had also paralysis of the fourth and sixth nerves. The pupil did not respond to light or on accommodation. There was complete ptosis. The eyeball was absolutely immobile and was directed forward. The patient also complained of severe headache, which he localized above and behind the orbit. Shortly after admission he had one night a “weak spell” which, however, was from the report not a

convulsion, and he never at any time had a convulsion. He was weak and broken down in health, which may be partly accounted for by the fact that he had malarial infection. He had several chills of the quotidian type, and the plasmodium was found in his blood. A course of quinine completely cured this. On one occasion only there was incontinence of urine and feces.

The progress of the case was marked by severe and increasing headache, emaciation, some slight mental changes amounting to a mild confusion at times, and loss of strength.

Shortly before death a careful examination showed the following condition:

The complete and total external and internal ophthalmoplegia remained. The ball was immobile and directed forward, the pupil was slightly dilated, there was slight exophthalmos and complete ptosis. The sensory tests were of great interest. There was complete anesthesia of the conjunctiva and in the whole territory of the supra-orbital nerve as far back almost as the vertex. Both the upper and lower lid were anesthetic on their edges except toward the inner canthus, which fact seemed to indicate that for some reason the nasal branch of the ophthalmic division was not completely involved. This was shown also by the fact that the mucous membrane in the interior of the nostril and the small patch of skin on the nose supplied by this branch were not anesthetic. There was retardation of tactile sense, but not complete loss, in the territory of the superior maxillary nerve. The inferior maxillary division of the fifth was entirely exempt, as was also its motor branch. The eighth nerve was not implicated, but there was slight overaction of the muscles supplied by the seventh, probably due to the pain which the patient suffered.

The ophthalmoscopic examination made by Dr. de Schweinitz revealed a slightly choked disc. The veins were too full, but the arteries were normal. There was no hemorrhage in the fundus. The pupil dilated evenly under atropin.

The diagnosis was of a syphilitic lesion at the base of the brain, just behind the orbit, involving especially the ocular nerves in the cavernous sinus, and implicating the ophthalmic division of the fifth and to a less extent the superior maxillary before it enters the foramen rotundum. As the inferior maxillary was not involved, and as the motor division of the fifth was exempt, it was concluded that the lesion did not extend as far to one side as the foramen ovale nor as far to the rear as the Gasserian ganglion.

This diagnosis was confirmed by the autopsy which gave the following results:

The temporo-sphenoidal lobe at the base was adherent and soft along a line extending along the under surface of the lesser wing of the sphenoid bone from about the sphenoidal fissure and anterior clinoid process backward along the cavernous sinus to the superior margin of the petrous portion of the temporal bone, extending about 3 centimeters from the median line. On removal of the brain this

area of attachment of the temporo-sphenoidal lobe was found to be occupied by a gummatous patch about the size of a small walnut, only flattened. It was soft on the surface and caseous within. This patch extended forward through the sphenoidal fissure into the orbit fully two centimeters. The Gasserian ganglion was just at the posterior border of the affected area, but not seriously involved. The walls of the cavernous sinus were infiltrated and eroded, the bone being almost crumbling. The foramen rotundum, which transmits the superior maxillary division of the fifth nerve, was beneath the gummatous tissue, but the nerve-trunk was not destroyed, and had evidently retained its function, although this, as already said, was somewhat impaired. The foramen ovale, which transmits the inferior maxillary division of the fifth nerve, was on the border of the affected area, but not sufficiently within it for the nerve to be involved. The most affected regions were the walls of the cavernous sinus and the posterior part of the orbit, and the space just behind the sphenoidal fissure. Hence the involvement of the third, fourth and sixth nerves, and the ophthalmic division of the fifth nerve is exactly accounted for. It is noteworthy that the optic groove and the optic foramen were rather anterior to the affected tissue, and this accounts for the comparative freedom of the optic nerve. As the ophthalmic artery also passes through this foramen its exemption, except in slight degree, is accounted for. The tip of the temporo-sphenoidal lobe, where it was attached to the mass, was very soft. The mass itself was of the nature of an infiltrating meningeal neoplasm, eroding the underlying bone.

OPERATION FOR PTOSIS.*

BY WILLIAM H. WILDER, M. D.,

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OPHTHALMIC SURGEON TO COOK COUNTY HOSPITAL AND TO WESLEY HOSPITAL.

ILLUSTRATED.

In those slight cases of ptosis, either of the paralytic or congenital variety, in which the levator palpebrae still retains some of its power, the stitch operations of Pagenstecher or Dransart for raising the lid by sutures passed from the margin of the lid beneath the skin to the eyebrow,

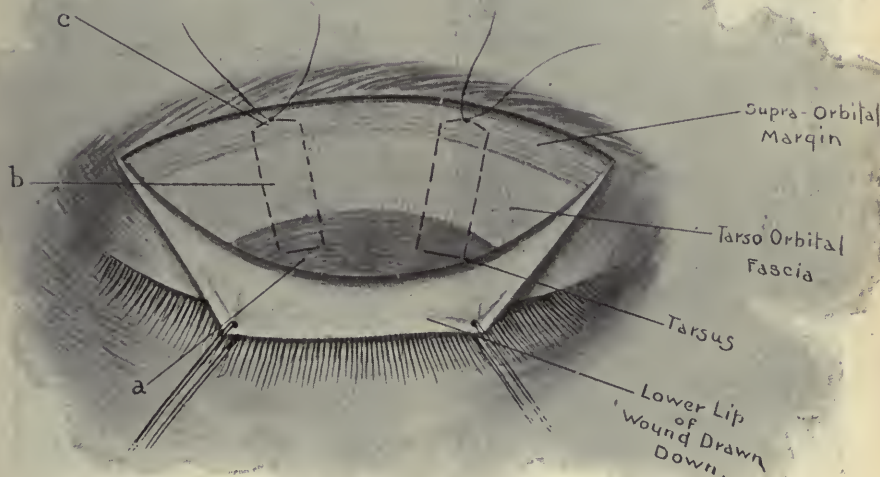


Fig. 1.

or the ingenious operation of Eversbusch for advancing the levator usually meet the requirements.

But in some cases of congenital ptosis it has been demonstrated that the levator of the lid is absent, and it is

*Read at the meeting of the American Ophthalmological Society, at Washington, D. C., May 4, 1897.

probably true that in most of them there is a faulty development of the muscle.

Again the muscle may be powerless because of an anomalous or defective development of its nerve center, illustrations of which we have in those peculiar cases of congenital ptosis in which the drooping lid can be raised only in association with certain movements of the jaw.

In complete paralytic ptosis we cannot reasonably expect to gain the desired correction of the deformity by advancing a muscle that is absolutely powerless and, at least in long standing cases, has suffered a partial atrophy.

In such cases the operation of Panas is largely practiced.



C. W. AGE 15.
Congenital Ptosis of Right Lid.
Operated February, 1896.



C. W.
One year after the operation

The criticism justly urged against this valuable method is, that in fixing the rectangular lid flap beneath the bridge flap, a raw surface is opposed to a skin surface with the result that after healing a little pouch is formed beneath the eyebrow in which dirt may accumulate to cause subsequent trouble.

The ideal operation is that which will restore to the lid the power of opening and closing the palpebral fissure at will, but this from the very nature of many of the cases is impossible of attainment.

The result with which we must be satisfied, after most operations, is that in which the lid is held up so that the patient can use the eye and can also close it enough to give protection to the cornea, and this should be accomplished with the least possible deformity.

The operation here described which I have done in a number of cases accomplished this result fairly well. It is indicated particularly in those cases of congenital and paralytic ptosis, in which the power of the levator is completely lost.

It consists in folding upon itself the tarso-orbital fascia as well as the aponeurosis of the levator which is intimately adherent to the fascia; and at the same time in establishing a secure connection of the upper lid to the firm tissues above the eyebrow.

The tarso-orbital fascia extends from the margin of the orbit to the tarsus, separating the connective tissue of the lid from that of the orbital cavity. Being a layer of deep fascia, it is continuous with the periosteum, and the upper part of it acts as a suspensory ligament for the upper lid.

By shortening this ligament the lid may be raised as much as desired.

After shaving the eyebrow an incision is made a little above the orbital margin but parallel with it through all the tissues down to the periosteum.

This incision may be one inch and a half or even more in length, but should be so placed that the resulting scar will be concealed by the eyebrow.

A retractor being used to draw down the lower lip of the wound, the skin and muscle are separated from the fascia by careful dissection until the tarsus is brought into view. This is more easily accomplished if an assistant puts the lid on the stretch. Sutures of fine sterilized catgut or silk armed at each end with a curved needle are passed in the following manner. The first needle is introduced deep enough into the tarsus to secure a firm hold at a point about at the junction of the outer and middle third and a little distance from its convex edge (a). (See Fig.) It is then drawn through and with it several gathering stitches

(b) are taken in the tarso-orbital fascia, after which the needle is made to pass through the muscle and connective tissue of the upper lip of the wound (c).

The other needle on the same suture follows a parallel course in the same manner, entering the tarsus about 3 mm. from the point of entrance of the first, then gathering the fascia into small folds and emerging in the tissue above, thus making a loop by which the lid may be drawn up (c).

The second suture is passed in the same way making a



E. H. Aged 36. Complete Ptosis of
Left Lid. Operated Aug. 29, 1894.

loop at the junction of the middle and inner third of the tarsus.

The requisite elevation of the lid may be now secured by drawing on the loops and tying the sutures, which are to be buried in the wound.

The lower lip of the wound is now united to the upper with fine sutures. The slight scar that remains after healing is almost entirely hidden when the eyebrows grow again.

The buried sutures become encapsuled and give additional strength to the folds of fascia that hold up the lid.

The orbicularis is uninjured so that the patient retains to a certain extent the power of closing the lids.

The oozing should be carefully checked before the wound is finally closed to prevent extravasation into the surrounding tissues and into the pouch formed by the dissection of the tissues from the fascia. Such a swelling may defeat the operation by causing the buried sutures to break their fastenings, before the folds of fascia have become firmly united to each other and to the margin of the orbit. To still further guard against such an accident and to give the lid temporary support until the deep parts have healed, the lid and the brow may be painted with collodion, or a small pad of cotton may be so placed in the dressing as to relieve undue traction on the sutures.

In one case upon which I operated, that of the boy whose picture is exhibited, suppuration followed because of some neglect or error in the antiseptic details, and an abscess developed in the upper lid which required drainage and irrigation, but this did not seem to impair the final result, although one of the buried sutures came away.

Within the last three and a half years I have practiced this operation, with a slight variation in detail, on thirteen cases, with sufficient degree of success to assure me that when properly done, it very satisfactorily corrects the deformity.

Most of the cases passed from my observation soon after they had recovered, and I am unable to speak of their present condition, but judging from those whose pictures I show I have reason to believe that the result is a permanent and satisfactory one.

It is true the number of cases is not large, but they show that complete ptosis may be relieved by shortening the suspensory ligament of the lid with buried sutures.

103 State street.

APPARENT CURE OF IDIOPATHIC EPILEPSY BY THE WEARING OF PRISMS.

BY F. G. MURPHY, M. D.

MASON CITY, IA.

David Simkins, aged 47, a painter by trade, has had epileptic attacks for twenty-three years. During the first five or six years he had them on an average of five or six times a year, but since that time they have occurred much more frequently; for the last four or five years he has had them every week, and sometimes a great many in a day for several months at a time. During most of the year 1894, he was comparatively free from attacks, but suffered more from intense neuralgia and melanchonia than during any of the other twenty-three years of his nervous trouble. From the time he began having such attacks he had suffered constantly from indigestion and constipation.

Dr. Osborne had been the family physician of Mr. Simkins all of this time, and he informs me that he was never able to use his eyes at close work for any length of time. He is an intelligent man, and being fairly educated, was very fond of reading, but had never been able to read except for a few minutes at a time on account of the resulting pain in and about his eyes.

About the the 1st of July, 1896, the patient consulted Dr. Stockman in regard to his condition, and was given the routine treatment for epileptics, such as opiates and the bromides, which had been previously prescribed by Dr. Osborne. Being president of the Austin Flint Medical Society, which was to meet at Clear Lake, July 21 and 22, Dr. Stockman suggested to Mr. Simkins that he be present at the meeting of the society and be examined by Dr. Gresham Hill, superintendent of the state asylum for the insane, who was to read a paper on nervous diseases. He was present at the society on Wednesday, July 22, and the history of his disease was given by Dr. Osborne, after which he was examined by Dr. Gresham Hill. Dr. Hill made a lengthy analysis of the case and gave an unfavorable prognosis, but suggested the continuation of opiates and bromides, that had been previously prescribed by Drs. Osborne and Stockman. A day before the meeting of the society, however, Dr. Stockman—thinking that Dr. Hill might call for an examination of the patient's eyes—sent him to my office. An examination of his eyes revealed no errors of refraction and found the fundi normal. With the vertical diplopia test there was an insufficiency of the inter-

nal recti of 6 degrees. Dr. Hill not having suggested the examination of his eyes, I did not report the result at that time. However, I had ordered prisms for him, 2° each eye, base in. At that time he had been having epileptic seizures regularly once a week, and had one the following Saturday, July 25. On Monday morning, July 27, he began wearing the prisms, and in the afternoon he returned to my office saying he felt great relief, but did not believe he would be permanently cured. He was free from neuralgia, and his mind was clearer. The following Saturday, August 2, he felt some twitching of the muscles of the face, but that was all. The relief was all that could be hoped for, except that for about two weeks the stomach continued out of order, and the bowels constipated.

Two weeks after the time he began wearing his glasses he was entirely free from any trouble, except general weakness. On August 20, I made another examination of the muscles, and found the same amount of insufficiency, but put on prisms this time which corrected the full six degrees of the insufficiency. The twenty-three years of epileptic seizures had shattered his nervous system so that slight physical exertion soon exhausted him. His mind was clearer and his memory began to improve. As his mental condition improved he became very fond of relating incidents that had happened in his boyhood days, but which he had not thought of for fifteen or twenty years. His improvement continued, and on November 17, I took him to the next meeting of the Austin Flint Medical Society, at New Hampton. The result of using the prisms was reported to the society as above. He had received no treatment other than the prisms that were prescribed, except for the first two weeks after July 25, during which time he was treated for his stomach and bowels, the opiates and bromides having already been discontinued.

Following this perfect relief from his former troubles—the epileptic attacks, constant neuralgia, melancholy, inability to read, stomach disorder and constipation—was enjoyed until Friday, November 28. On that day he contracted a severe cold, due to exposure to the extreme cold weather of several days. His long illness had brought him to abject poverty, and he had been receiving some support from the county, but for some reason did not receive his allotment of fuel. His cold lasted nearly a week, during which time he had several epileptic attacks. On Tuesday, November 30, which was a very cold day, he was removed to the county poor house, five miles from the city. He had an attack on that day and one the day following. He was placed in a warm room, however, and since his

second day there, December 2, to the present time, November 16, 1897, he has been free from any of the symptoms of epilepsy. On December 28, '96, I measured his power of *abduction* and *adduction* with prisms. The former was 6°, the latter 18°. On March 16, I again tested his *abducting* and *adducting* power, and found practically no change from the examination made on December 28. His distant vision had always been 20/20. Spheres plus 1.50 D. gave him perfect vision at fourteen inches.

January 10, '98. I have just had a letter from Mr. S., who is now living in St. Louis. His health is excellent and he has never had a single epileptic attack since last report.

None of his near relatives have had insanity, epilepsy, marked hysteria, or any other neurosis. His mental health is completely restored, and his physical condition is good and continues to improve.

[This apparent cure of idiopathic epilepsy is of such decided interest, that I have asked Dr. Murphy to furnish the ANNALS with a supplementary report of the case a year hence. Meantime, in view of our experience of such examples of probable cure, one may pertinently ask, what is the *modus curandi* in this instance?—C. A. W.]

THE MODUS OPERANDI OF THE OPERATIVE TREATMENT OF GLAUCOMA.

BY DR. STÖLTING,

HANOVER, GERMANY.

ILLUSTRATED BY TWO DRAWINGS AND ONE DIAGRAM.

[Translated by Dr. W. H. Rumpf and edited by Dr. Casey A. Wood, of Chicago.]

Since the time of von Graefe a number of theories and conjectures have been advanced to explain the fact that iridectomy diminishes the intra-ocular pressure in glaucomatous eyes. Von Graefe himself, as is well known, was at first of the opinion that the decrease in size of the iris (resulting in a diminution of secreting surface) as well as the filtration through the scar tissue were the principle factors at play. Later on, however, he discarded both explanations and confessed his inability to explain the phenomenon.

Von Hippel and Grünhagen* proved experimentally that iridectomy in normal eyes of rabbits, dogs and cats resulted in a diminishing of intra-ocular pressure, provided that one-sixth of the iris had been removed.

Donders believed the result to be due to a relaxation and consequent lessening of the irritation to the nerves caused by the high degree of tension. This theory corresponds with his views on the etiology of glaucoma. Schmidt-Rimpler rightly opposes to this the results of the experiments of von Hippel and Grünhagen, according to which cutting of the trigeminus does not necessarily cause a decrease in the intra-ocular pressure. This condition, moreover, does not arise until corneal lesions have occurred and the membrane permits a drainage of the aqueous humor.

According to Schnabel† glaucoma is primarily a disease of the blood vessels, consisting partly in an actual anatomical lesion of the walls of the vessels and partly in a spasmodic contraction of the same and iridectomy "removes

**Archiv für Ophthalmologie*, XVI, p. 44.

†*Archiv für Augenheilkunde*, XV, p. 385 and 386.

in a manner for the present quite inexplicable, the morbid irritability of the vaso-motor nerves of the retinal vessels, thus arresting the degenerative process in the walls of the blood vessels."

As von Graefe* took the position that glaucoma was caused by choroiditis, he naturally argued that iridectomy had a direct effect on the actual cause of the disease. He expressed himself very guardedly on this subject as follows: "It is difficult to decide whether iridectomy, aside from its reduction of the intra-ocular pressure, has a direct therapeutic effect on the disease of the chorioidea or not. In some cases we notice after operation such a remarkable clearing of the vitreous body that such effect cannot be denied. We cannot, however, count on this result with absolute certainty, nor can we hope to prevent completely the well known and much feared recurrence of effusion into the vitreous. The latter, it is true, seems to be much less dangerous after the operation; their effect, however, must be counteracted by other therapeutic measures among which repeated inunctions and setons take the first rank."

The discovery of Knies and Weber of the synechia in the "angle of filtration" in glaucoma apparently offered the final explanation of the phenomenon. The effect of the operation was evidently due to the removal of the synechia in the angle. A large number of authorities adhere to this view at the present date in spite of the objections that have been raised. Chief among these are the fact that sclerotomy without excision of the iris may have a curative effect and that many glaucomatous eyes present no adhesion in the angle of the chamber. Lebert† circumvents these objections with the explanation that sclerotomy causes a decided relaxation of the tissues, which permits the iris to sink back into its normal position and to again establish free drainage. Admitting that this explanation does away with the first objection, it is certainly not satisfactory for the second; for it is an undoubted fact that in a large number of glaucomatous eyes—I call attention especially to hydrophthalmia—synechiae do not exist. Sclerotomy or iridectomy, moreover, effects a cure in these cases although there is no "sinking back of the iris." It is readily understood,

**Archiv für Ophthalmologie*, XV, p. 171.

†VII Internat. Ophthalmological Congress in Heidelberg,

therefore, that a number of authors attach no particular importance to the excision of the iris *per se* and consider the incision through the various coats of the eye as of greater moment. Thus Coccius declared that the effect of iridectomy is similiar to that of paracentesis. The former, however, presented a very high degree of development in this particular form of operation.

Investigations of von Graefe,* who saw complete cure after paracentesis in two cases and temporary relief in many, seemed to strengthen this opinion, although von Graefe has cautioned us not to draw definite conclusions from them. He attached some prognostic importance, however, to the operation. If after a simple puncture the pressure be perceptibly diminished, one could assume that this would also be the case after an iridectomy. Certain it is, that this thought is repeated in a different form by those who lay principal stress on free filtration through the membranes of the eye as the main object to be accomplished in this operation. Von Weber, for instance, has followed along this line of thought while Critchett and Coccius have tried to increase the filtration of the aqueous contents of the chamber by causing a slight incarceration of a bit of iris in the iridectomy wound. The procedure was abandoned later on account of the liability to cause irritation. In like manner Schmidt-Rimpler† expressed himself and calls attention to the fact that "broad, transparent scars are of the greatest importance and advantage in the curative effect of the operation in chronic glaucoma, because they facilitate the filtration of the intraocular pressure." In laying stress on the peculiarity of these scars he correctly answers the contention of Schweigger that cicatricial tissue is firmer than the tissue of the sclera. Menacho‡ also takes a decided stand on the question of filtration through the scleral wound. He highly recommends massage twice daily for some time after the operation. Even from massage two years after operation he noticed a slight chemosis.

Snellen§ also put in a plea for sclerotomy with its

**Archiv für Ophthalmologie*, III, 2, p. 489, as well as *Archiv für Ophthalmologie*, II, 2, p. 302.

†*Handbuch der gesammten Augenheilkunde*, von Graefe and Saemisch. V, p. 114.

‡1889, *Heidelberger Ophthalmoe. Gesellschaft.*, p. 107 and 108.

§VII Internat. Ophthalmological Cong., Heidelberg, p. 244 ff.

attendant filtration. "Sclerotomy acts partly as a paracentesis by emptying the anterior chamber. Even the filtration of the posterior fluids is beneficially stimulated." He attaches especial importance to the simultaneous use of myotics which cause a contraction of the external meridional fibres of the ciliary body and thus a tension on the membrana Descemetii. "If the latter remains tense after sclerotomy, the inner borders of the sclero-corneal wound will gape more and thus cause a free filtration into the canal of Schlemm." Snellen does not consider the effect of the operation for glaucoma to be due to the excision of a piece of iris. On the contrary, he endeavors to leave the sphincter iridis muscle in tact. Pflüger* prefers the latter modification of iridectomy. According to Snellen every operation for glaucoma should be a sclerotomy and only in recurrent cases does he resort to iridectomy.

Arguing from the standpoint that after an iridectomy or sclerotomy the bulb frequently remains hard, that in other words its contents have no opportunity to find an outlet, there has arisen in the last ten years a method for producing direct filtration from the posterior chamber. To this end *posterior* sclerotomy has been introduced which consists in making the scleral incision beyond the ciliary body. The wound is made to gape by turning the knife, according to the suggestions of Parinaud† and Priestley Smith.‡

Fuchs§ reported a case in 1886 in which there was no restoration of the anterior chamber six weeks after iridectomy and which was subsequently cured by a posterior sclerotomy. A complete restoration of the chamber did not take place, but the visual power was improved from the counting of fingers at the distance of a few feet to one quarter of the normal vision. Schweigger†† saw a complete restoration of the anterior chamber after a scleral puncture. It persisted for four weeks until the scleral wound had healed firmly. A comparison of the results of sclerotomy posterior with those of sclerotomy anterior can hardly be given, because all operators resorted to the

*VII Internat. Ophthalmological Cong., Heidelberg, p. 276.

†Transactions of the Société Française d'Ophthalmologie, 1888.

‡Transactions of the Internat. Ophthalm. Congress, Edinburgh, 1894.

§Verhandl. der Oph. Gesellsch. Heidelberg, 1886. Discussion on the paper of Javal.

††Archiv für Augenheilkunde, XXXII.

posterior only when other operations had failed, and then, it is true, obtained many gratifying results.*

Permanent cures, with restoration of good vision, will probably seldom result from this operation, unless, perhaps, it happened to have been the one first selected. We shall consider later on why it should not become the normal operation. Not only the greater danger of injury to more important structures should contra-indicate its adoption, but theoretical reasons, speak so decidedly in favor of anterior sclerotomy, that the latter should be given the preference in all cases except those in which the normal operation has failed.

Exner† explained the effect of iridectomy on absolutely different lines. In injected specimens of eyes treated by iridectomy he noted that in the stumps of the iris there were large anastomoses between the large arteries and veins without formation of intermediate capillaries. From this he draws the conclusion that the blood pressure in the small vessels of the iris and of the anterior portions of the chorioid must be lessened. As the intra-ocular pressure doubtless is dependent upon the pressure in the vessels, the former will fall when the latter is diminished.

Ullrich,‡ on the other hand, assumes a sclerosis of the tissue of the iris, which prevents the free passage of the lymph from the back to the front, and that the iris is consequently carried by the lymph-stream against the cornea. The cleft in the iris (coloboma) represents to him only an opening which counteracts the effects of the sclerosis.

Aside from iridectomy and sclerotomy, a number of operations have been recommended in the last few years for the cure of glaucoma. I mention, in the first place, iridosclerotomy, scleral incision with iridodialysis, incision of the angle of the iris, operations which, as their names imply, are more or less similar.

Knies§ recommends iridosclerotomy—cutting through the iris at its insertion—a sort of artificial dialysis. He claims that the effect is the same as an iridectomy, without the danger of the healing in, prolapse or cystoid cicatrization,

*Cf. also Knapp, Trans. Amer. Ophth. Soc., 1884, p. 302, and Grüning, Ibid, p. 291.

†*Sitzungsbericht d. k. Akad. d. Wissenschaften*, Vol. 65, May 1872, and *Jahresbericht d. Gesellschaft der Wiener Aerzte*, 1873, I.

‡*Archiv für Ophthalmologie*, XXX. 4, p. 235.

§*Bericht d. Heidelberger Ophthalmol. Gesellsch.*, 1892, p. 118.

of the iris. In all cases a communication between the posterior and anterior chambers is established.

In the "Correspondence" of the *Klinische Monatsblätter*, 1894, p. 16, Logetschnikow claims the priority of this latter procedure. He alleges that he described a similar operation in 1880, and called it Sclerodilatatorectomie.

De Wecker† also puts in a claim for priority. He asserts that Abadie (Staphylotomie), Panas (Iridosclerotomie), and Nicati (Sclerotomie), have proposed similar methods of operation. Wecker adds that cicatisotomy, which he performs when the effect of iridectomy passes away, should be done at a point a little beyond the angle of the old scar in order to separate iritic adhesions, which are almost always present. This operation, he believes, covers that of Knies, because it makes the incision through sclera and iris. After calling attention to the great difficulty and danger attending the operation of Knies, especially in acute glaucoma, von Wecker recommends a new operation, viz., broad scleral incision with iridodialysis. In performing this operation he inserts a closed iris forceps into the anterior chamber, opening it with its teeth in close proximity to the periphery. He then seizes a fold of the iriss and pushes the forceps toward the centre of the cornea. The appearance of hemorrhage is an indication that the breaking up of the adhesions has been successful.

De Vincetiis also makes incisions into the angle of the iris, as is reported by Tailor (*Centralblatt für Augenheilkunde*, 1891, p. 466) and Aug. Romano (*Archiv. di Ottalm.*, I., p. 57)*. De Vincetiis constructed a special instrument for this operation. From Romano's conclusions the inference may be drawn that he considered the operation successful, because it removes to a great extent the obstacles to free drainage.

At the Italian Ophthalmological Congress in 1895 this operation of Vincetiis was again a subject for discussion, and Sgrosso and Gallenga expressed themselves as well satisfied with the results. At this point we must also record the recommendation made by two writers at the Edinburgh Congress to create a fistula leading to the anterior chamber. One of them, Walker,† describes a procedure

†De Wecker, Simple and Combined Sclerotomy, Trans. VIII., Internat. Ophthal. Congress, Edinburgh, 1894, p. 343.

*Cf. also *Archiv für Augenheilkunde*, 34 p. 103, and Bocchi: *L'incisione del tessuto dell' angolo irideo del de Vincetiis nell' idroftalmo*, *Archiv. di Ottalmologia*, IV., p. 130.

†New Method of Relieving Tension in Chronic Glaucoma. Transactions of the VIII. Internat. Ophthalmolog. Congress, Edinburgh, 1894.

having for its object the healing of a strip of conjunctiva into the sclero-corneal incision. He claims to have used this method for the last four years, and is convinced that he saved the eyesight in several patients. Pflüger† recommends a similar procedure. He introduces a cross-shaped piece of gutta percha tissue into the wound. At the time he could not report any actual cases. Glaucoma, however, is mentioned last among the indications which would necessitate this mode of operation. This drainage of the anterior chamber, as he calls it, he recommends primarily in conjunction with antiseptic injections in cases of serious infection, in detachment of the retina and in keratoconus.

Aside from these operations, whose purpose is, above all to re-establish the filtration-canals, I shall briefly mention those procedures that are founded on entirely different theoretical grounds. Thus Hancock recommended cutting through the ciliary muscle, or at least he made the attempt to cut this muscle. The description of his operation, however, as de Wecker* points out, makes it appear probable that the cut did not go through the ciliary muscle, but through the sclera.

In connection with the old glaucoma theories of Donders it will be necessary to consider the operation of Badal. It consists in twisting or tearing the nervus nasalis externus (Henle's infratrochlearis). Badal has noticed that after this operation the pain in acute glaucoma is almost always removed and the intraocular pressure diminished; in fact a definite cure often results. In chronic glaucoma its effect is uncertain, and the results are less favorable. The reason why this author attacked this particular nerve in his endeavor to effect a cure is because it is in close relationship with the ciliary ganglion, inasmuch as the long-sensory root of the ganglion arises from the first branch of the trigeminus. The dissection of the nerve is done at the inner-orbital border.† It is important to en-

†Ibid., p. 63.

*De Wecker: *Traité Théorétique et Practique des Maladies des Yeux*. Paris, 1863, p. 510.

†Badal gives the following directions:

"Appliquez le doigt indicateur sur le globe, immédiatement au dessous du rebord orbitaire supérieur, la face palmaire en avant et l'extrémité du doigt reposant sur le côté du nez. Le point d'émergence du nerf se trouve assez exactement sur le milieu de l'ongle." Place the index finger on the bulbus immediately under the superior orbital border, the palmar surface facing to the front and the extremity of the finger resting on the side of the nose. The point of exit of the nerve will be found at a point corresponding to the middle of the nail.

deavor to pull out not one, but at least two nerve fibres and to operate as bluntly as possible. Lagrange considers it probable that the root of the ganglion is destroyed at the same time. He does not wish to place himself definitely on record in regard to this point, because the anatomical proof is wanting. He draws his conclusions from the fact that the pain ceases so suddenly.

The practicability of the operation has again been confirmed of late (1894) by V. Indovina.† He praises it especially because it removes the pain, notably in absolute glaucoma, where neurotomy opticociliaris or enucleation would be the only operations in question. Furthermore he recommends its use in cases in which there is an infectious conjunctivitis on account of which an operation on the eye itself would be contra-indicated. Finally he lauds it as an excellent procedure to prepare the eye for an iridectomy.

We observe that a large number of conflicting opinions exist concerning the causal factors that tend to produce a cure from operations in glaucoma. An accident furnished me with a valuable hint as to what indications must be first met in the treatment of glaucoma. In the course of some experiments on the subject of glaucoma I was engaged in studying the effect of ligation of the *venæ vorticosæ* in the eye of the rabbit and the increased intra-ocular pressure consequent upon this procedure, and I found that the eye of one rabbit which had been treated in this manner had burst open on the morning following the evening of the operation. A large mass of coagulated blood protruded from between the eyelids, and on more careful examination it was noticed that the site of the rupture was situated near to and just to the outside of the limbus of the cornea. It involved about one-fifth of the circumference of the cornea. The observation that the eye ruptures just at this point was not new to me. I had seen the same occurrence when abscesses, caused by injection of micro-organisms into the anterior chamber, ruptured. Besides I had observed analogous statements in literature. What surprised me in this case was to find the rupture occurring in so short a time, and I decided to kill the rabbit in order to make a thorough study of the pathologic process that had caused such a condition of affairs. I shall briefly describe the experiments here:

†Vincenzo Indovina. El nervo nasale externo nel Glaucoma.

In a large black rabbit the four venæ vorticosæ of the right eye were ligated on October 27, 1896. Immediately after the operation the bulbus was extremely tense, the pupil was half dilated and showed no reaction, whereas that of the left eye reacted promptly. After the lapse of half an hour the ophthalmoscopic view was still quite clear. No decided changes could be detected with certainty. An hour later, at 10:10 p. m., an ophthalmoscopic examination was still possible, and the optic nerve showed a much more marked hyperemia when compared with that of the left eye. The tension was still more increased. On the following morning I found the eyeball ruptured. The break in the limbus measured 1 cm. Coagula protruded from the wound.



Fig. 1.

The animal was killed and both eyes hardened in formol. The section through the operated globe showed that the entire cavity was filled with blood. The lens was missing; it had been forced out at the time of rupture. For the microscopic examination the eye was divided so that the place of rupture was left in connection with the limbus lying directly opposite and a second series of sections was cut on a plane perpendicular to this. The fact that attracted my attention most in the microscopic examination was the presence in all of the sections of a blood-infiltration in the region of the limbus. The character of this infiltration is alike in all slides and may be seen in the appended drawing (Plate I.). Beginning with a broad base at the ligamentum pectinatum it extends along the limbus anteriorly, presenting a tongue-shaped figure. The point touches the epithelium of the cornea in a few places. In some slides, as may be seen from our appended draw-

ing, the real blood-infiltration does not extend quite so far, but in the parenchyma of the cornea just anterior to the infiltration, there may be seen numerous spaces, the borders of which are closely lined with red blood corpuscles and cells with several nuclei. We have evidently to deal with widened lymph-spaces.

In this zone of blood-infiltration, whose characteristics I have just described so far as the region of the limbus is concerned, there may be noticed, on inspecting the opposite side of the slides of this series, the location where the rupture took place. It is probable that the accident was



Plate I.

occasioned by the animal striking its eye against some hard object. At all events, the limbus was predisposed to rupture on account of the lymph and blood infiltration.

The extent of the bloody and serous infiltration in the cornea and sclera in this eye may be seen from a study of the figures of Plate I. The first represents the diseased eye, the second the corresponding section of the healthy eye. The thickness of the cornea at a point described by

line drawn from the region of Schlemm's canal obliquely forward measures in series Ia, 1.37, in series Ib 3.86, in series Iib 0.84 mm. The corresponding thickness of the healthy cornea is 0.31 mm. In the anterior portion of the sclera of the diseased eye the thickness measures 0.71 mm. in series Ia, 0.58 mm. in series Ib, and 0.52 mm, in series Iib. The measurements in the normal eye are from 0.12-0.18 mm. These results are averages drawn from three or four measurements.

It is readily understood that such a decided increase in thickness cannot be accounted for merely by the swelling of the various cell elements, but that there must have been a loosening up of the structure of the tissues. On these lines I should explain the bloody-serous limbus infiltration. It will be remembered, in this connection, that we noticed free spaces in the blood infiltration in numerous slides. The sclera did not increase in thickness as much as the cornea, a fact due, possibly, to the greater density of its tissue. No spaces are found in the former, but on the other hand we have a very marked cell proliferation. We find beside the flat, pale, endothelial connective tissue cells accompanying the vessels, numerous other cells whose plainly stained nuclei appear scattered about indiscriminately, forming irregular masses. Frequently it is impossible to discover a membrane and the little masses of nuclei appear to lie free in the tissue. From the circumstance that they are generally found together in rows, we may infer that they belong to cells that have wandered into the lymph spaces.

Taking the picture as a whole, there is in my estimation only one explanation of the process, and that is, that in consequence of the greatly increased intra-ocular pressure a bloody serous infiltration of the region of the limbus occurred, originating from the spaces of Fontana. The contents of the eye sought an outlet here, but on account of the excessive secretion of intra-ocular fluid, they could only partly escape through the canal of Schlemm. Consequently the walls of the eye, and especially the loosely woven lamellæ of the cornea were forced asunder. The forerunner of the blood was evidently the aqueous fluid, which, even before the hemorrhage into the anterior chamber occurred, was compelled to leave the normal lymph channels, now unable to satisfy the increased demands on their capacity, and find an outlet in the surrounding tissues.

As no conclusive evidence could be gained from a single observation, I made further experiments and tried to protect the eye of the animal from injury, by bandages.

On February 4, '96, at 5:15 p. m., I tied the venæ vorticæ of the right eye in a large gray rabbit under ether narcosis. Even after two veins had been ligated an increase in pressure was perceptible, and it became greater as the operation advanced. The bulbus protruded somewhat from the orbital cavity. At the close of the operation, 6:15, a hyperemia of the opticus could be noticed. The papilla did not participate in this except that its edges seemed slightly more injected. Pulsation-phenomena could be seen neither in the veins nor arteries. The refracting media were still quite clear; the pupils of both eyes did not react, possibly, because the animal was still under the influence of the anesthetic. At 7:45 the condition was the same with the exception of an increase in the previously existing chemosis.

At 9 o'clock the tension was so great that it was difficult to make an impression on the eyeball. Occasional streaks of blood came from the upper margin of the pupil. They seem to arise from behind the iris and sink to a horizontal level, having its upper border at a point corresponding to the lower quarter of the anterior chamber. Below this level the contents of the chamber are coagulated. The iris is very hyperemic, the cornea still sensitive. Details are no longer visible in the fundus oculi although even now one can discern the white gleam of the papilla. The bulbus is very prominent, the edema of the conjunctiva, in spite of the incisions which were made at the time of operation, is increasing; the cornea is still clear. At 9:30 the hemorrhage has increased visibly. The iris, especially in its periphery, is pressed against the cornea. This is less noticeable in the nasal portion on account of the chemosis. Blood may be seen to flow from behind the iris into the anterior chamber. At 10 o'clock the entire region of the pupil is suffused with blood and the lower half of the chamber is filled with a sanguinolent fluid. Cornea still transparent and sensitive.

At 10:30 the anterior chamber is two-thirds full of compact masses of blood. Collodion dressings. February 5, 9 a. m. The dressing is intact, although the animal evidently made strenuous efforts to remove it. Both lids are swollen; the eyeball is very prominent. The cornea is

quite clear. The anterior chamber is entirely filled with blood except in the periphery where the iris is pressed against the cornea. Dressing.

6:30 p. m. Externally the eye is little changed. The cornea is quite clear, as before.

February 6, 6:30 p. m. The tension is still very great, possibly greater than yesterday. The cornea shows a slight diffuse opacity. A little below the center an irregular, oval grey spot about 2 mm. long is noticeable, showing a few whitish, very delicate dots. The actual hemorrhage into the anterior chamber is diminished. We can now speak more correctly of a sanguinolent aqueous fluid which, however, still has a dark red gleam in the center of the pupil, whereas it grows gradually paler towards the periphery. The chemosis of the conjunctiva is much less marked.

February 7, 6:30 p. m. The cornea is more opaque than yesterday. Tension very high. Chemosis of the conjunctiva entirely disappeared. The bloody discoloration of the aqueous fluid less marked. Dressing.

February 8, 9 a. m. Tension slightly less, though still greatly increased. The cornea is more opaque so that it is difficult to explore the anterior chamber. The epithelium of the cornea appears finely punctated; it is less rough, however, than is noticed in the human eye. The limbus appears red in consequence of newly formed blood-vessels, but is not chemotic.

Animal killed in narcosis by being bled to death.

The top of the cornea is removed with a razor for the purpose of examining the nerves, and especially their passage through Bowman's capsule. On making the incision the sanguinolent fluid gushes out.

Beginning here again with the limbus, which claims our principal attention, we find a picture very similar to the one described in the first experiment. A conspicuous difference, however, is manifested by the fact that the region of the limbus in this case contains less blood, but more cellular elements. The immigration of cells has evidently started from the region of the canalis venosus although neither the latter nor any substituting lymph spaces are recognizable. Furthermore, we again notice a decided edema of the cornea. This edema does not affect the lamellæ of the posterior quarter of the cornea, those situated right next to the membrane of Descemet. The rea-

son for this is possibly the circumstance that the intra-ocular pressure was greatest upon the internal lamellæ, thus prohibiting any serous infiltration. In numerous sections (not in all) the lamellæ in the neighborhood of the infiltration are divided into exceedingly fine fibrillæ. Under the microscope they appear like delicate strands of hair, lying together in bundles that cross each other at various angles. In many sections the anterior portions of the sclera are found greatly loosened. In good sections this can be plainly recognized, and may be readily differentiated from spaces caused by artificial tears made by the microtome knife.

Between the loosened lamellæ are found red blood corpuscles and other cells. The former especially are arranged in long chains and are frequently flattened out by their close contact with the tissue surrounding them. Of the other cells some have one, some several nuclei and between the posterior lamellæ we may again discover scattered nuclei lying in open spaces. They are arranged in rows like the red corpuscles, except in the anterior portions where the edema is greatest. Here they show no regular arrangement. The force of these changes in the limbus is similar to that described in the other eye and is coincident with a line drawn in an oblique direction from the region of the circulus venosus to the front of the cornea. Whereas in the first eye we found the greatest infiltration in the neighborhood of the internal lamellæ, in the second the external fibers are most affected. Large lymph spaces were not noticed in the second eye. In the conjunctiva there are many ectatic veins, some of them containing coagulated serum.

The relations of the various structures within the anterior chamber to each other are, of course, difficult to determine. After the first incision and in consequence of the great vis a tergo, the iris and lens naturally advanced. Consequently we find the iris pressing directly on the cornea and behind the iris coagulated blood, filling entirely the space between iris and lens. This coagulum extends so far to the periphery that it covers up the anterior part of the ciliary process; the equatorial part of the lens, however, is free. The coagulum is composed of red and white blood corpuscles, pigment and fibrin. In most places the various elements can be readily distinguished, though they occasionally have a more homogenous appearance so that

the constituent parts are but faintly indicated. Some of it escaped through the corneal incision, but it remained in connection with the rest of the eyeball and was hardened with it.

Scattered hemorrhages are found on the zonula, but the vitreous body is entirely free from them.

We may say that the anterior half of the uvea with the exception of the iris, but including the ciliary process, is in a condition of excessive blood infiltration and swelling. In the iris alone this increase in size is absent. Perhaps the combined pressure of the lens and the cornea may be held accountable for this fact. All other parts are very greatly thickened. Even the lamellæ of the supra-choroidea contain hemorrhages and show on a meridional section a beautiful representation of longitudinal layers of fibers interspersed with layers of blood. At the point of emergence of the venæ vorticosæ, however, the choroid shows no abnormalities. The entire posterior portion presents no morbid changes.

We find the vorticose veins within the sclera engorged throughout. Even hemorrhages have taken place in the region of the vein and into the lamellæ, a proof that the walls of the vessels were permeable. The posterior part of the retina appears to be raised by an exudate. (It is possible that the handling of the specimen has caused this.) There is no excavation of the optic nerve.

On the whole we have noticed a like effect in both eyes. As I was anxious to study the process in its earliest beginnings a little more closely, I performed the same operation on a third animal, stopping the experiment when at the end of three hours slight streaks of blood became noticeable in the pupil.

At 6:30 p. m., the venæ vorticosæ of the eye of a large white rabbit were ligated. Immediately after the operation, which lasted an hour, the eyeball protruded, the iris was much darker than that of the healthy eye on account of the hyperemia, and the anterior chamber was more shallow. Tension increased.

At 9 p. m. the protrusion had increased. The anterior chamber not discernable at the periphery and very shallow. The blood vessels of the iris are so extended on the surface that they almost make the impression of small hemorrhages. The pupil is half dilated.

At 9:30 p. m. the ophthalmoscopic examination could

be carried out incompletely through the non-reacting pupil. The refracting media began to be opaque although no positive hemorrhages could be discovered. The papilla was barely visible but it was not possible to detect the presence of any hyperemia. At 10:10 p. m. striated hemorrhages began to appear and to sink downward. They extended as far as the horizontal plane carried through the point where the iris meets the cornea. The iris showed both circular and radial folds. The animal was again anesthetized and killed.

The microscopic examination discloses a considerable swelling of the whole uvea, exclusive of the iris and ciliary processes in the two first series of sections, which were ev-



Plate II.

idently taken from the upper portion of the eye. We do not find all parts of the iris and ciliary processes so completely filled with blood infiltrations in these first sections as we do in the later ones. The choroid, however, is infiltrated even in these slides. In Series III the ciliary processes appear like thick clots of blood pressed against the

iris. No structure can be recognized in them. The iris is filled with venous blood extravasations. The thick walled arteries appear like islands in the surrounding hemorrhages. They are apparently little changed. The root of the iris is very edematous and its tissue filled with red corpuscles (Plate II). From this point we now observe how the corpuscles have made their way behind the membrane of Descemet. They are already arranged in rows. These then represent the beginning of the changes which we were enabled to study in an advanced stage in the two other eyes.

It would be difficult to decide whether the extravasated blood corpuscles, which we find in this region, originate from the aqueous fluid or from the neighboring vessels.

The choroidea and supra-choroidea show changes similar to those in the iris. They are thickened by extravasated blood corpuscles and serous exudates. The supra-choroidea is in places $1\frac{1}{2}$ times as thick as the sclera.

The configuration of the anterior chamber is, of course, modified by the thickening and discoloration of the iris. To a great extent the iris presses directly upon the cornea, the central part of the cornea over the middle of the anterior chamber and a circular space at the periphery are left free, however. The latter is probably kept open in the eye of the rabbit by the well developed and projecting supports of the spaces of Fontana. I did not see a communication between the two open chambers. It may have existed only during the last hour by means of a capillary space, formed by the folds of the iris or between iris and cornea. Red blood corpuscles are found in both chambers. Even in the zonula they are numerous, not, however, in the vitreous body.

We have now obtained an instructive picture, showing the manner in which the eye tries to rid itself of its superfluous contents. The spaces of Fontana and their continuation, the canal of Schlemm and the veins are the factors that help to keep up proper drainage. This well known fact has often been demonstrated by injecting soluble and insoluble substances into the anterior chamber. In our experiments, however, we see how these paths may easily become insufficient. The task is too great. The masses of exuding fluids from the veins that have been tied cannot be carried away. The lymph system becomes paralyzed and we soon find the tissues infiltrated

with serum and blood, the latter increasing in proportion to its extravasation into the anterior chamber. The tension must, of course, rise.

An interesting point arises here in regard to the operative therapy, and that is the consideration that this loosening of the tissues occurs only in the limbus-zone anterior to the canal of Schlemm. Not the sclera, not even the more centrally located lamellæ of the cornea are affected, but only a small portion of the limbus. Into this the incision is made which, as experience has shown, is often sufficient to definitely relieve the pathologic tension in the eyeball.

This edematous infiltrated zone above all must be opened before the lymph can flow out freely. And it can also be easily understood why on account the change in the tissues a rapid close of the wound is improbable. It is not difficult to conceive how a cystoid scar might result when we consider the breaking up of the tissues into small fibrillæ, as may be seen from the sections in my second case. The conditions for primary union are certainly very unfavorable. Another point presents itself: The infiltrated zone forms a ring about the limbus and the spaces in which the edema is situated are undoubtedly connected with each other. In this way the edema-ring could, if necessary, drain the entire anterior chamber through the outer wound. I need hardly mention that this experimental result is in entire accord with clinical experience.

Furthermore we can understand the effect of anterior sclerotomy in that it opens this ring at two points. Theoretically, iridectomy should accomplish the same thing, and, as is well known, it is even more effective. I should not like to be called upon to give a definite reason for this fact. I believe, however, that not infrequently, I might almost say as a rule, little bits of iris tissue become fastened in the wound and thus prevent its closure later on. I do not mean large pieces that can be seen as black protuberances, but small fibers remaining fixed in the corners of the wound.

A posterior sclerotomy could have for its object nothing but a drainage of the supra-choroidea. It is, of course, an acknowledged fact that relief is often given by this procedure. It is more correct, however, under all circumstances to unburden the anterior channels of filtration first, and, if possible, give them time to regenerate.

Of course, I realize in these remarks that the connection between a clinical glaucoma and the rise of tension thus artificially produced is perhaps rather slight, and it would be daring to draw any definite conclusions. Yet I should like to assume that the increase in the bulbar contents in glaucoma and in my experiments have many points of similarity. In the former, it is true, the amount of exudate does not seem to play so important a role as its chemical properties. Not three hours, but months and years pass by before the stoppage in the drainage is complete and often an apparently insignificant event may give the final stimulus to latent morbid conditions. Here also the operation is effective. Perhaps for a short time only, if the main disease cannot be eradicated or if the wound heals up too rapidly, and perhaps forever in more fortunate cases.

On a former occasion I tried to explain the process I have just described by comparing it to the conditions in the brain caused by an increased intra-cranial pressure.*

*Transactions of the Heidelberger Ophthalmalogische Gesellschaft, 1897.

ABSTRACTS FROM RECENT GERMAN OPHTHAL-
MIC LITERATURE.

Quarter Ending January 1st, 1898.

BY

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OF

MILWAUKEE, WIS.

Operative Treatment of Excessive Myopia.—Bacteriology of Suppurative Keratitis.—Choroidal Hemorrhage After Extraction of Senile Cataract.—Choroidal Hemorrhage After Ulceration.—An Injurious Effect from Holocain.—Auto-Ophthalmoscopy.—Traumatic Diseases of the Macula Caused by Electricity.—Prolapse of the Iris in Extraction of Senile Cataract and Its Prevention.—Roentgen Rays and Foreign Bodies in the Eye.—Enucleation of the Eye with Movable Prothesis.—Upon the Use of Large Doses of the Iodids in Ophthalmic Practice.—The Pathology of Naphthalin Cataract.—Eucaïn B.—The Influence of Proper Illumination Upon Acuity of Vision and the Development of Myopia.—Anesin.—Upon the Occurrence and Meaning of Differences in the Pupil in Esophageal Carcinoma.—The Treatment of Conjunctivitis Granulosa et Tuberculosa.—Trachoma and Its Treatment.—The Theory and Treatment of Retinal Detachment.—The Detection of Foreign Bodies (small shot) in the Eye by Means of the Roentgen Rays.—Bacteriology of Trachoma.—Mollusum Contagiosum and Follicular Conjunctivitis.—Removal of Copper from the Eye.—Advancement of the Levator Palpebræ in Congenital Ptosis. Pupillary Disturbances in Hysteria.—Painless Cauterization with Nitrate of Silver.—Nature of Vernal Conjunctivitis.

Operative Treatment of Excessive Myopia.

VOSSIUS, A. (*Beitr. z. Augenhkde.*, XXIX, Septem-

ber, 1897,) has operated upon 27 eyes in 21 selected cases of high myopia. He adheres strictly to the standpoint of v. Hippel, and does not operate upon low or middle grades in young individuals with strong accommodation, but only upon excessive myopia of 12 D. and upward. In a few cases he has operated in short-sighted children with M. 10 or 12 D. where the process was very rapid and where there were changes in the neighborhood of the optic nerve and further damage threatened. All highly myopic patients who have been operated upon by removal of the lens by discission, hail with joy the opening of a new world and would not exchange their condition for that which they had before. It is to be regretted that this operation has been widely published in the daily papers, as many poor people may have their hopes raised, and be but doomed to disappointment. A table of his 21 cases is appended; the first 9 of which have been under observation for two years. The cases were between the 7th and 27th year of age. He has had no experience with old people. When possible, he operates upon both eyes. Choroïdial diseases, etc., have never been made worse, but the health of the eye has been helped by the operation. He has not seen detachment of the retina, and in only one case did he have bleeding into the macula. He does not agree with v. Hippel that a month or a year after the operation, detachment of the retina is possible. He does not advise the cutting through of the lens in its entire thickness, but prefers a number of discissions with several weeks interval. After the operation he employs warm compresses and a mydriatic. The occurrence of particles of the lens in the anterior chamber has not caused much irritation, and has never led to glaucoma. He has not had infection of the wound and in only one case has he had strabismus convergens of the poor eye; but when this was operated upon, the eyes became parallel. He recommends the operation warmly and places it in the same plane as the operation for soft cataract by discission. He does not recommend extraction of the clear lens, and states that discission of the secondary cataract, if necessary, is less disagreeable and less dangerous when the operation

is done by a discession according to the method of Thier.

H. V. W.

Bacteriology of Suppurative Keratitis.

UHTHOFF, W. AND AXENFELD, TH. (*Archiv. f. Ophthalm.*, XLIV., 1, 1897,) present a continuation of their study of this subject, which they previously published in XLII., 1, 1895. They endeavored to ascertain whether pneumococcus infection of the cornea often existed alone in typical *ulcus corneæ serpens*, and whether pneumococcus infection of the cornea always gave rise to atypical *ulcus corneæ serpens*, and the amount of injury, etc., which modified this typical condition; how often other micro-organisms were found in hypopyon keratitis in conjunction with pneumococci; whether the diagnosis of *ulcus serpens* could be made by the existence of pneumococci, and why *ulcus serpens* had not been found in children; what were the relation of the bacteriologic findings in the cornea to that of the accompanying lachrymal diseases; also to make a differential diagnosis by inoculation experiments upon mice between pneumococcus and ordinary streptococcus infection. They also report a new case of keratomycosis. In all 68 cases are described, 34 of which were *ulcus serpens* in 25 cases of which only pneumococci were found; 8 cases mixed with xerobacilli and staphylococci. In 1 case a diplococcus. In 13 cases of atypical hypopyon keratitis pneumococci were found alone in 2 cases; combined with other organisms in 3 cases; no pneumococci were found in 8 cases. These were complicated with other local eye diseases. In 3 cases of xerophthalmus in children in the first month with rapid keratomalacia mostly the streptococci pyogenes were found together with a moderate amount of pseudo diphtheria bacilli. In 5 cases of serofulous superficial keratitis, one case xerobacilli, one case the same bacilli with staphylococci, and one case staphylococci alone were found. There were 7 cases of keratitis dendritica in 2 of which xerobacilli were found, and in 2 others xerobacilli with staphylococci; another case staphy-

lococcus aureus and albus; in 1 case negative. In 1 case of ulcer rodens the bacteriologic examination was negative. Two cases of keratitis pannosa et trachoma, in 1 xerobacilli, in other negative. In 1 case of parenchymatous keratitis in congenital syphilis examination was negative. Two cases of corneal change in vernal conjunctivitis, examination negative. One case of keratomycosis the aspergillus fumigatus were found. In all cases where the clinical diagnosis of typical ulcer corneae serpens was made there was likewise found the Fraenkel-Weichselbaum diplococcus, in most cases in a clear culture, in a small proportion of cases sparsely mixed with staphylococci and xerobacilli, so that the disease may be termed a pneumococcus infection. True, mycotic keratitis is a somewhat rare affection. The recent literature of the subject is freely quoted.

H. V. W.

**Choroidal Hemorrhage After Extraction of Senile Cataract.
Choroidal Hemorrhage After Ulceration.**

PURTCHEP. (*Centralbl. f. prakt. Augenheide.*, July, 1897,) reports the case of a 64-year-old laborer who came on account of cataract, but who also had conjunctival inflammation, which was controlled. The loss of vision had begun in the right eye fifteen years, in the left, one and a half years before. The right eye had a hard brown nucleus and normal light sense. The cataract in the left eye was not complete, and he could count fingers at $2\frac{1}{2}$ m. Generally he was healthy, except he had a certain amount of arterial sclerosis. A normal cataract operation by the modified v. Graefe method was done upon the right eye with no immediate complications except that there was sinking in of the cornea. Nearly eight hours later blood was noticed under the bandage. When this was removed blood was observed upon the cornea, and coming out of the wound for about 7 mm. was a dark red swelling of the choroid, but there was no vitreous in the wound and none lost. Morphin injection and bandage was used. The bandage was stained and renewed about every two hours afterward. A 1 per cent. nitrat of silver solution and atrop-

pin were used, but not stood very well. For fifteen days afterward there was a bloody watery discharge from the eye. The eyeball became soft, and after a while the wound contracted and the eyeball became blind and somewhat tender, although not painful. He concludes that this eye should have been enucleated.

In a 47-year-old servant who came concerning bleeding of the right eye, which had gone on for three hours. He said that he always had weak sight and since his 20th year had night blindness. His three brothers had the same trouble, but his four sisters had sound eyes. His father and mother had sound eyes, but the latter was the only daughter and had three brothers, all of whom were night-blind. He had previously had ulcer of the cornea for three months, which had healed, leaving a staphyloma and had reduced the vision of that eye. Eight days before he had considerable pain on the right side of the head. He noticed this day, while feeding a horse, a pressure and sharp burning pain in his eye, and considerable blood then came out of it. In the left eye there was retinitis pigmentosa and large posterior polar cataract; irregular pupil. In the right eye on removal of a blood stained handkerchief, a large dark red bloody swelling, about the size of a small chestnut, protruded from the lids, arising from the cornea, composed of the choroid, iris, ciliary body, etc. The eye was removed at once. In the illustration the tumor is two-thirds the size of the enucleated eyeball. H. V. W.

An Injurious Effect from Holocain.

Bock, E. (*Cent. f. prakt. Augenheilkde.*, September, 1897,) says he has used holocain in 17 cases for anesthesia without poor results, using a 1 per cent. solution. In the 18th case on a peasant woman, aged 71, who had inflammatory disease of the eyes, in one of which there was a small pterygium and posterior synechia, both sides of which there was mature senile cataract. The case was treated with 2 per cent. nitrat of silver and afterward under cocain anesthesia, double iridectomy was made which

was followed by normal healing. Although in one eye superficial ulceration of the cornea set in, which was cured by nitrat of silver and scopolamin. He proposed to extract the cataract upon one eye and dropped in holocäin in the same manner which he had hitherto used it, but the eye became very red, immovable, dry and dull, and the conjunctiva in the lower half became folded and in a very short time the tissues looked as if they had been put in alcohol. The cornea became smoky, the edge especially acquiring a ring-like opacity; the conjunctiva of the eyelids were not changed. There was no desquamation. The patient complained of great pain. He did not operate, and put on a bandage. Half an hour later the conjunctiva of the lids looked about the same, the under eyelid damp. The conjunctiva of the eyeball was not changed. The cornea was already clear, the opacity being much less except at the edge which remained the same. The next day the eye was more inflamed, but moist with superficial erosions on the conjunctiva and superficial ulcerations on the edge of the cornea. The patient complained of considerable pain, was treated with iodoform and scopolamin. Appearances improved, and three days later silver was used to the lids. Ten days from the dropping in of the holocäin solution the appearances were the same as before with the exception of a rather rich muco-purulent discharge. He thinks that the changes in the eye were due to the holocäin producing dryness and rapid roughening of the tissues, leading to the formation of ulceration. The epithelium of the conjunctiva and cornea was changed. Holocäin was prejudicial to the life of the epithelial cells.

H. V. W.

Auto-Ophthalmoscopy.

WESSLEY, R. (*Cent. f. prakt. Augenheilkde.*, October, 1897,) describes a simple method of seeing one's own retina, for which is needed only an angular looking glass, which may be readily improvised by taking two small pieces of mirror glass at an angle. Such a glass reflects objects

twice, giving doubly reflected images, one within 120-90 degrees, the other within 90-72 degrees. The head is brought within the angles of the glass and the right eye looks at the image of the left, and *vice versa*. As the head cannot be brought much nearer than reading distance to the glass, the angle of the glass should be about 95-75 degrees. (See figure.)

A candle flame is then brought near the glass and the eye to be observed is shadowed, while the other eye is

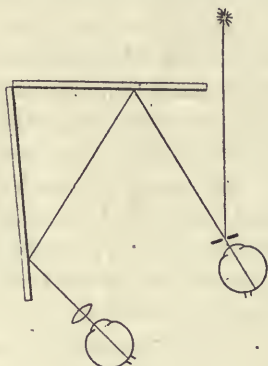


Fig. 1.

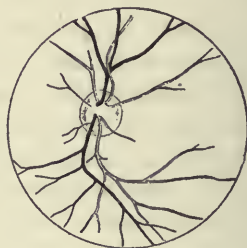


Fig. 2.

lighted. Before the latter an ophthalmoscope is held so that the light from its mirror is reflected into the glass and into the pupil of the other, which is seen in the looking glass to be lighted, and is fixed by the observing eye. Then a convex lens is placed before the examined eye when it is readily observed that the fundus is clearly seen in the mirror, about the same area as one can ordinarily observe in another person. It is easy to change the angle of the reflecting mirror to bring any part of the eyeground into the middle of the ophthalmoscopic pictures. To see the optic nerve head when the eyes are parallel, the angle of the glass should be 84 degrees. The upper or lower portion of the fundus may be seen by altering the glass to or from the perpendicular.

H. V. W.

Traumatic Diseases of the Macula Caused by Electricity.

HAAB, O. (*Klin. Mon. f. Augenhkde.*, July, 1897,)

remarks that the macula is the most vulnerable part of the retina, and is most often affected by mechanical and chemical insults. The vulnerability of the macula cannot be explained entirely by the lessened amount of blood which it receives, as has been claimed by Wagenmann. A strong electric current upon the eye does not cause a peculiar lesion, and it is hard to say whether its effect is due to chemical or physical action. He reports the case of a 34-year-old machinist who, on the day of examination, had touched the two brushes of a dynamo with his hands and the strong electric current from the dynamo had gone in, or rather out of his right eye when working with an automatic regulator between the accumulating battery and the machine. He felt a needle-like pain in his eye, and since that time had headache more on the left than on the right side. He did not now see clearly, especially toward the under part of the fixation point. The machine produced a current of 125 amperes with 120 volts, but at the time of the accident was only making 60 amperes. There was no outward visible signs except that the pupils were somewhat small. The sight was reduced to 3/18 in the right eye; in the left was normal. Ophthalmoscopic examination was negative, but the visual field showed in the lower half of the fixation point an unclearly defined area of poor vision. This was not observed on the next day and the sight of the eye had come up to 3/10. Ophthalmoscopic examination this day showed an interesting change in the macula; a delicate milky opacity over the entire area of the macula so that normal epithelium was not visible. In the middle of the macula this swelling was less. The fovea looked light red. In the upper part of the fundus there were seen whitish yellow patches of irregular form and size, somewhat like those seen in old people, and usually called swelling of the vitreous layer. There were two of these spots in the middle of the fovea. No changes were observed in the retinal vessels or in the papilla. These changes gradually grew fainter until two months later the vision of the eye was over 3/4 to 1, and nothing was observed in the fundus. The literature of the subject is reviewed. This case bears a marked resemblance to that of

Oliver, reported in the Transactions of the American Ophthalmological Society in 1896. It is peculiar in that all results of the accident disappeared in two months, and that no cataract followed.

H. V. W.

Prolapse of the Iris in Extraction of Senile Cataract and Its Prevention.

PFLUGER, (*Klin. Mon. f. Augenhkde.*, October, 1897,) prefers simple extraction on account of the resultant appearances of the eyeball, the lessened reaction and rapidity of healing, the seldom occurrence of irritation of the iris, and especially the bloodlessness of the operation. The patients make quicker recovery after simple extraction, usually leaving the hospital in six to eight days. P. has not seen glaucoma after simple extraction, and believes Knapp's relatively common experience to be due to too speedy performance of a secondary operation. At present most operators are eclectic, doing in some cases a simple extraction, and in others the combined operation, largely on account of the danger of iridic prolapse in the former. P. is likewise skeptical regarding Knapp's assertion that only 3 per cent. or 4 per cent. of iridic prolapses occur in generally well-done simple extractions. The causes of prolapse are:

1. Hypermaturity or immaturity; especially adhesiveness of the cortex.
2. Method of operation.
3. The general condition and character of instructions to the patient.

Over-ripeness of the cataract renders simple extraction difficult or impossible. Because if the capsular thickening has gone very far, the lens must be extracted with the spoon, which is difficult or impossible with an intact pupil in other than with an extremely tractable patient. A smooth bow-like linear incision with a high flap, the counter puncture being made about 1 mm. above the horizontal meridian of the cornea, the cut being made entirely in the clear cornea with a sharp knife, avoiding saw-like movements, prevents prolapse of the iris during the corneal in-

cision, and allows of easier passage of the lens. Turning of the knife forward at the counter puncture is sometimes necessary. After the capsule is opened the lens should be expelled by turning on its horizontal axis by pressure backward on its under edge. The upper edge must not only be made to come sufficiently forward so that it presents at the wound, but sufficiently more so that it passes through the pupil easily. A very rigid sphincter prevents this procedure, but may be helped by pressure with a spoon in the hands of an assistant, just as rupture of the perineum is prevented at child birth. P. uses a modification of Desmarres blepharostat for the upper lid, the lower being held by the finger, believing that spring blepharostats are dangerous. The cortical substance should be removed as completely as possible from the anterior chamber, as their retention is apt to cause secondary prolapse of the iris as well as secondary cataract. The general condition of the patient causes complications, as intra-ocular hemorrhage, as well as iris prolapse. Fearful and unwilling patients who press hard at each breath can force the iris out of the eye so that its reposition and a resultant round pupil is not to be thought of. In restless cases this cannot even be secured by deep narcosis. If cases are chosen with propriety, prolapse of the iris in senile cataract can generally be prevented and the simple operation is indicated in most cases. Normal healing may be expected if the operation has been done smoothly and the iris shown no tendency to fall forward during the operation, and if the anterior chamber be free from detritus, even if the patient sits up in bed without support or bandage. If the pupil remains irregular and the iris has to be replaced a second time and if lens particles remain in the capsule and the patient is not quiet, there is danger of prolapse. In such a case P. does not use myotics, but makes a very small, but broad peripheral iridectomy which he claims absolutely prevents further prolapse. This is made after the iris has been replaced, the toilet of the anterior chamber done, the instruments removed, patient set up and vision tested by fingers. Then he raises

the upper lid with the little finger of the left hand, passes a small straight iris forceps in the wound, seizes and excises a small peripheral piece about 2 to 3 mm. wide, 1 to $1\frac{1}{2}$ mm. high. In restless patients it is necessary to replace the fixation instruments. He has done this operation for a number of years. H. V. W.

Roentgen Rays and Foreign Bodies in the Eye.

FREEDMAN, (*Klin. Mon. f. Augenhkde.*, October, 1897,) recommends the employment of Roentgen rays to determine whether a foreign body is present in the eye or orbit, and also its position and size, and gives details of three cases in which they proved of service. It is preferable to use the rays in bitemporal diameter than antero-posterior only. The photographic plate is fixed to the temple by means of a bandage, while the vacuum tube is placed 50 cm. from the plate. One and a half minutes are sufficient for the exposure. The rays have shown a presence of foreign bodies where the magnet has failed. H. V. W.

Enucleation of the Eye With Movable Prothesis.

SCHMIDT, H. (*Klin. Mon. f. Augenhkde.*, November, 1897) shows the disadvantages of operations by which the whole or portion of the bulb is preserved, as in optico-ciliary-neurectomy, staphyloma, exenteration operations, etc., and states that the disadvantage of the ordinary enucleation is the lessened cosmetic effect occurring on account of sinking in of the eyeball, which from the standpoint of some operators, counteracts the lessened danger of sympathetic ophthalmia. In the ordinary enucleation, the ends of the muscles and the conjunctiva are allowed to slip back into the orbital fat, and lose their effect upon rotation of the eyeball. He operates as follows: Loosening the conjunctiva at the edge of the cornea, and undermining it for about 1 cm., he seizes the bulb with a sharp hook sunk into the sclera, takes hold of the superior rectus muscle with forceps, cuts through its tendon and passes in a catgut

stitch behind the forceps, doing the same to the rectus externus and internus. Then he cuts the tendon entirely away from the sclera, and then cuts through the other muscles, takes the ball out and passes each stitch through its respective portion of the conjunctiva and ties them, passing stitches in the same way through the three other muscle tendons, after the eye is out, puts in a light tampon of gauze and binocular bandage, which is first changed in five days and a monocular bandage substituted. The period of healing takes seven or eight days. He claims much less sinking in of the eye and a much better movement of the stump by this method. H. V. W.

A similar method to this has been described by Suker in the ANNALS OF OPHTHALMOLOGY, October, 1895, and by Würdemann in the *Ophthalmic Record*, November, 1895.

Upon the Use of Large Doses of the Iodids in Ophthalmic Practice.

PAGENSTECHER, H., (*Klin. Mon. f. Augenhkde.*, December, 1897,) recommends very much larger doses than is advised by the pharmacopiea, meaning by this, not less than 5 grams a day and upward, to 25. grams or more, the latter being the highest dose he has personally used, although he understands that others have exhibited even greater doses than 30 g. a day. He believes that iodism is much less apt to be brought on by large doses than by small ones. He recommends the exhibition of iodid potassium as a rule in connection with the bromid, prescribing usually 20. of the iodid, 7.50 of the bromid, to 200 of water, giving the first day one teaspoonful three times directly after meals, and never on an empty stomach. This is to be taken either plain, in Seltzer water or in milk, in the latter especially if the stomach membranes are irritable. He increases this daily by one teaspoonful until 8 to 10 g. of iodid are taken. After eight to fourteen days he usually lets them have iodid of soda in the same or stronger doses, and believes this can be taken for many weeks. In one case he gave 25. of iodid of soda a day for

a length of three weeks, without any iodism being produced. He has had specially good results with the iodids in a case of orbital tumor which had been supposed to be sarcoma, which was cured in about six weeks by this treatment, being no doubt a gumma. He recommends it especially in episcleritis and scleritis, claiming that the disease is rapidly cured. He has also used it in paralysis of the ocular muscles with good results. He recommends the method of v. Arlt, brought forward twenty-three years ago, of using iodid of potassium ointment about the eye in beginning cataract. He has used it in many cases, and has no doubt that it can bring the cataractous process, especially the diffuse form of opacity, to a standstill, and in some cases increase the vision.

Realizing the deference due to the eminent author of this article, the editor would criticise his administration of potassium iodid with Seltzer water, for when potassium iodid is exhibited in this fluid, the free carbonic acid gas acts upon it, liberating free iodine, which is irritating to the mucous membrane of the stomach and must certainly give rise to gastric irritation. The statement that iodism is less apt to be brought on by large doses than by small ones, is certainly contrary to reason. The recommendation of heroic doses of the iodids together with recommendation of local treatment with iodid ointment, by the latter of which infinitesimal doses must be admitted within the economy, is a peculiar method of reasoning. H. V. W.

The Pathology of Naphthalin Cataract.

✓ KLINGMANN, (*Archiv. f. path. Anat. u. Phys. u. f. Klin. Med.*, Bd. 149, H. 1, 1897.) In 1887 there were a number of publications concerning cataract produced by naphthalin and recently opacity of the cornea from the effect of naphthalin has been described. K. has experimented upon a large number of rabbits, using chemically pure naphthalin in liquid paraffin (1:8) which was given the animals through an elastic catheter passed into the stomach. One to 2 g. of naphthalin were given each animal every twenty-

four hours. This combination did not produce intestinal catarrh or diarrhea, and was generally well borne. Twelve hours after the administration the first effects could be seen in the lens, and in four weeks an entirely mature naphthalin cataract was produced. The animals were observed from day to day, and trial examinations made. They generally lost in weight. In about 10 per cent. examination of the urine was made, which showed that phenol was excreted together with blood corpuscles and kidney epithelium, and the urine was greatly changed in character. The affections of the lens and cornea, which have been called naphthalin cataract and corneal opacity are secondary and due not alone to disturbance of nutrition in the eye, but are a result in large part of general changes. The first changes are certainly observable in the eye, occurring as enlargement of the blood vessels, hyperemia and extravasation of blood into the ciliary body, processes and iris. It is especially observable in albinotic rabbits after twenty-eight hours. The changes in the lens and also those in the cornea are to be described as secondary, and are to be referred to irido-cyclitis. Inflammatory changes do not alone occur in the eye, but also in the kidneys, liver, spleen and heart. Naphthalin cataract does not come on as a primary disease of the uvea and has not been observed by him to be combined with diseases of the retina, and is not alone due to hyperemia and disease of the blood, but also to the local inflammatory process.

H. V. W.

Eucaïn B.

VINCI, G., (*Archiv. f. path. Anat. u. Phys. u. f. Klin. Med.* Bd. 149, H. 2, 1897,) reports further upon this newer form of eucaïn in an article similar to his first report. The first portion of the article is taken up with the chemical combinations and relations. The drug belongs to the benzoyl group. He describes its effects when applied locally and upon the general organism, upon the heart and circulatory system, and gives a table of the bac-

tericidal qualities of cocain, eucain and eucain B; eucain B. being similar to eucain, preventing the development of bacteria, while cocain has no such effect. Eucain B. causes hyperemia through paralysis of the peripheral sympathetic fibers, but is much less irritant than eucain, which tends to depreciate the value of the latter in practical use. Anesthesia is caused as in the case of cocain and eucain by direct contact of the drug with the sensitive nerve endings. Eucain B. like eucain, does not cause whitening of the conjunctiva, widening of the palpebral fissure, or of the pupil. The general action of eucain B. is not only upon the central nervous system, but like curaré, it paralyzes the motor ends of the nerves and the vagus. From a practical standpoint eucain B. is the same kind of an anesthetic as eucain, but it has an advantage over this in that it is much less of a local irritant and less poisoness, and likewise has a stronger bactericidal action. It is not soluble beyond $3\frac{1}{2}$ per cent. in water; 2 per cent. is all that is necessary for ophthalmic practice. It is cheaper than cocain or eucain. For its anesthetic qualities eucain B. is equal to cocain and eucain, and often better. H. V. W.

The Influence of Proper Illumination Upon Acuity of Vision and the Development of Myopia.

SEGGER. (*Munch. Med. Woch.*, Nos. 38 and 39, 1897,) considers the various causes of myopia, and gives tables indicating the development of myopia in schools, showing that the percentage of myopes in higher classes rises progressively both as to those pupils who are myopic when entering school, and those who develop it during the course.

S. shows further that this condition of myopia exists not only in schools frequented by the better classes, but also in the village schools, and that with the myopic condition acuity of vision suffers likewise. A statistical study of the myopes found in schools and barracks at present as compared with those of years ago, proves that acuity of vision has improved in all classes, and this is attributed to the better hygienic condition existing in schools and barracks;

with special reference to the improved facilities for natural and artificial light. H. V. W.

Anesin.

VAMOSSY, V., (*Deut. Med. Woch.*, September 2, 1897,) says that anesin in a 5 per cent. solution does not produce any local irritation or general poisoning. It is a trichlorpseudo-butyl-alcohol or aceto-chloroform. The author's researches, as well as those of Kossa, show that it is also a hypnotic, 0.5 g. to 1 g., producing a normal sleep free from unpleasant effects. The author has succeeded in preparing a 2 per cent. watery solution which has a markedly anesthetic action. When applied to the tongue it produces a sensation as of a foreign body, and then anesthesia. The cornea can also be rendered anesthetic. When injected subcutaneously anesin also acts as a local anesthetic. Experiment shows that its use is unattended with danger. Israi finds that it quickly produced anesthesia when applied to the larynx, pharynx or nasal mucous membrane, and that it produced no unpleasant symptoms. Grösz in the eye clinic concluded that though it would not replace cocain in the larger operations, yet the absence of mydriasis and the duration of the anesthesia speak much in its favor. Anesin does not produce anesthesia of the iris. Hüttl describes its value in operations, both minor and some major, and he concludes that its use is very simple, that the anesthesia is limited to the infiltration site, and that it is harmless. Autal has used it with success in dental operations. Where concentrated solutions of cocain may be used, as in the larynx, then anesin does not enter into competition with cocain. In the case of the eye, it has the disadvantage of developing its full effects only when brought into actual contact with the tissues, as its power of diffusion is small. In the extirpation of small warts, etc., the patient should not be exposed to the dangers of cocain when anesin will suffice. Hüttl does not use it in the case of inflammatory tissues, as the puncture of the needle is as painful as the incision. The author rec-

ommends anesin as a good and harmless anesthetic, and he hopes that further researches will confirm his view.

H. V. W.

Upon the Occurrence and Meaning of Differences in the Pupil in Esophageal Carcinoma.

HITZIG, TH., (*Deut. Med. Woch.*, No. 36, 1897). The differences in the pupil caused by one-sided paralysis of the sympathetic has often been observed in mediastinal tumors but has not yet been described as occurring in the not uncommon cancer of the esophagus. The author has found difference in the pupil six times in thirty-seven cases; in five of which there was left-sided myosis caused, perhaps, by the course of the esophagus being generally more to the left side. He does not solve the question why the sympathetic was more often affected than the recurrent nerve, although the esophagus lies nearer to this than to the body of the sympathetic; also in four cases where the carcinoma was deeply rooted as the origin of the root of the first dorsal which communicates to the oculo pupillary fibers would cause difference in the pupil. H. V. W.

The Treatment of Conjunctivitis Granulosa et Tuberculosa.

KUHNT, H., (*Deut. Med. Woch.*, No. 38, 1897,) mentions in detail the conditions under which the various forms of treatment should be pursued, and describes the method of treatment, concluding with the following resume:

1. Conjunctivitis granulosa and follicularis are independent affections due to individual infections.
2. If blepharospasm, disease of lachrymal sac or faulty position of the cilia exist with granulosis, treatment should first be directed against the complications.
3. Treatment is to conform to stage and form of disease, and must be selected with reference to external and individual conditions.
4. Consideration must be given to the fact of the patient's living in an immune or infected district, and

whether or not he must return to trachomatous neighborhood.

5. Medical treatment is adapted only to mild cases in an immune, or nearly immune district.

6. For all severe cases, treatment directed to the isolated destruction of the granules (asgalvanocausis) or mechanical and operative methods must be considered.

7. The most effectual mechanical methods are brossage and the roller operations.

8. Where the tarsus is swollen or infiltrated, these mechanical methods should be preceded by scarification.

9. In pandemically infected districts galvanocausis, brossage and expressive operations are frequently followed by relapses or reinfections.

10. Surgical methods (excision of tarsal folds alone or with a strip of tarsus or enucleation of tarsus) if properly done and in selected cases, are followed by no bad results.

H. V. W.

Trachoma and Its Treatment.

NEESE, ERNST, (*Deut. Med. Woch.*, No. 43, 1897,) cites his experience with this disease in a hospital practice of fifteen years duration. Corneal complications were found in 90 per cent., pannus in 52 per cent., and total blindness in 3 per cent. of all cases. Though the usual remedial measures were employed, the author speaks very favorably of the use of creolin in 1 to 2 per cent. aqueous solution, and finds good results from its use in fresh progressive cases, but especially in the sclerotic and dryer forms of follicular trachoma, with not too marked a pannus. The operative procedures included splitting of the outer canthus, canthoplasty, Schneller's operation (excision of palpebral fold followed by suture of conjunctiva), expression of granules, scarification, etc. For the pannus, periotomy was practiced; for the serous iritis and iridochoroiditis, iridectomy. The author also practiced probing of the lachrymal canals, for in many cases of pannus he found this condition much influenced by narrowing of

the canal. In 10 per cent. to 18 per cent. of his cases the lachrymal canal was affected, and he derived much benefit from the passage of the sound. H. V. W.

The Theory and Treatment of Retinal Detachment.

SCHMIDT-REMPER, H., (*Deut. Med. Woch.*, No. 44, 1897,) opposes the "retraction theory" of Leber as the cause of detachment, and favors the "secretion theory" (that retinal detachment is in most cases due to choroidal exudation, not to disease of the vitreous.) That there are cases following vitreal disease is doubtless true, but they are few. The treatment pursued is, therefore, not that directed to the vitreous, (injections into its substance) but consists mainly in pressure bandage, sweating, mercurialization, and possibly repeated scleral punctures. A number of cases are cited. H. V. W.

The Detection of Foreign Bodies (small shot) in the Eye by Means of the Roentgen Rays.

FRIDENBERG, PERCY, New York, (*Deut. Med. Woch.*, No. 46, 1897,) reports an injury in which several shot found lodgement in both eyes. He was able to discover and locate five shot by means of antero-posterior and lateral skiagraphs of the head, passing through the orbit. The sensitized plates were wrapped in black paper and bound closely to the head with bandages. The reproduced photographs are not very satisfactory. H. V. W.

Bacteriology of Trachoma.

MILLER, LEOPOLD, (*Wien. Klin. Woch.*, No. 42, 1897.) In this preliminary report the author announces that he has succeeded in isolating a bacillus morphologically and culturally, like the influenza bacillus, which he found in eleven out of fifteen cases of trachoma. In sclerotic trachoma the bacillus was found only in such cases in which there was a mucus discharge. The same bacillus was also

found in sections of trachomatous conjunctiva. In twenty-five cases of non-trachomatous discharging conjunctivitis (gonorrhoea, catarrhalis, follicularis, tuberculosa, etc.), the examination was invariably negative.

In his report to the Vienna Medical Society (*Wien. Klin. Woch.*, No. 43,) M. announces that, though his bacillus resembles the influenza bacillus, he thinks it is not identical with it. He is careful also not to make a positive claim as to the causal relation between this bacillus and trachoma, and refers to future investigation on the subject.

H. V. W.

Molluscum Contagiosum and Follicular Conjunctivitis.

ELSCHNIG, A., (*Wien. Klin. Woch.*, No. 45, 1897,) reports seven cases of follicular conjunctivitis associated with molluscum contagiosum, and expresses the belief that a chronic follicular conjunctivitis is not rarely prevented from healing by the presence of mollusca on the borders of the lid. E. rejects the theory of Burchardt, that both affections are the result of the same irritant, but thinks it probable that in some cases the molluscum is the direct cause of the conjunctivitis, in that the latter is due to irritation of the epidermal molluscum scales. Just as in these cases the molluscum contagiosum can act as the irritant, so he thinks papilloma and eczema of the lid the cause of conjunctivitis.

H. V. W.

Removal of Copper From the Eye.

HIRSCHBERG, J., (*Berl. Klin. Woch.*, No. 15, 1897.) There have been great advances made during the last sixteen years in extraction of splinters of iron from the eye, by which we have learned concerning the removal of other metals which will not follow the magnet. The removal of splinters of copper is, as a rule, difficult, and their immediate removal is very important, because although copper particles may be aseptic, yet when in the vitreous they will cause suppuration through chemical irritation. The author

describes two cases of extraction of copper splinters. In the first, the injury occurred over a month before his coming to the clinic. The sight was reduced to seeing fingers at 4 ft. in the nasal part of the visual field. The foreign body was determined by the ophthalmoscope to be in the vitreous chamber. Under deep narcosis H. made a long meridional cut and removed the foreign body. Forty-five days after the operation the vision was reduced to seeing fingers at 3 ft., and there was a moderate defect of the field toward the nasal half, after which the sight improved somewhat.

In the second case, he proceeded in the same manner to remove a piece of percussion cup which had been in the ciliary body for a long time.

H. V. W.

Advancement of the Levator Palpebræ in Congenital Ptosis.

WOLFF, H., (*Berl. Klin. Woch.*, No. 46, 1897,) describes a new method of advancing the levator palpebræ by which swelling of the lid accompanying the usual operation, is materially lessened. The tied ends of the severed muscles are made to lie on the anterior surface of the tissue, thus avoiding pressure of the cornea.

H. V. W.

Pupillary Disturbances in Hysteria.

WESTPHAL, A., (*Berl. Klin. Woch.*, Nos. 47 and 48, 1898,) cites in detail three very interesting cases of pupillary disturbances associated with great hysteria. In the first case, the pupils were myotic to a high degree, and did not react to concentrated light rays; occasionally the pupils were seen to dilate, and then it was possible to get a prompt reaction to light. In the second case, there was limited bulbar motion, convergence, diplopia and myotic and non-reacting pupils. By hypnosis it was possible to alter these conditions. In the third case, the pupils were widely dilated and non-reacting to light. In the first two, the pupillary conditions existed only between the hysterical seizures, in the third, during the attacks themselves.

In none of these cases was the pupillary condition permanent. Central (cortical) irritation or paralysis is mentioned as a possible explanation of these pupillary phenomena associated with hysteria.

H. V. W.

Painless Cauterization with Nitrat of Silver.

SAALFELD, E., (*Therap. Monats.*, September, 1897,) recommends a solution of nitrat of cocain in cases where local anesthesia is necessary. Its effect is as satisfactory as that of the hydrochlorat, and it forms no precipitate with the silver salt.

H. V. W.

Nature of Vernal Conjunctivitis.

SCHLEICH, G., (*Festsch. des Stuttgarter arztl. Vereins Stuttgart*, 1897.) S. has made special observations regarding the general condition in cases of spring catarrh of the conjunctiva. In ten cases he invariably found a general swelling of the lymph glands, polyadenitis and observed that these patients were always pale and anemic. In one case he found an enlargement of the spleen. In nine cases out of ten, examination of the blood shows increase of the white blood corpuscles in comparison to the red. It is, however, to be remarked that only in one case a thorough count of the blood corpuscles was made, although in the remaining cases the total amount was estimated in the manner in which blood examinations are usually made in daily practice. Re-examination of these findings with more thorough enumeration of the blood corpuscles is to be desired.

H. V. W.

ABSTRACTS FROM CURRENT AMERICAN AND
ENGLISH OPHTHMOLOGICAL
LITERATURE.

BY CHARLES H. MAY, M. D.,

NEW YORK.

**On the Employment of Electrolysis as a Means of Treat-
ing Granular Lids.**

SNELL, SIMEON, F. R. C. S., Edin., of Sheffield Eng.
(*Ophthalmic Review*, July, 1897.)

“The modes of treatment suggested at one time or another for granular lids have been numberless, and some apology may be deemed necessary for introducing yet another to this list. My only excuse is, that experience suggests that it may find a place in certain cases as an alternative to other methods. I have now employed electrolysis in the treatment of trachoma in something more than a dozen cases. Usually speaking, they have been chronic and very much the class in which sulphate of copper is used with advantage.

The method of using electrolysis is as follows: The negative pole is applied to the cheek and the positive to the everted surface of the upper eyelid. To apply it effectively, Messrs. Down Bros. made me a flattened and curved platinum end; this can be inserted into the holder which the same firm constructed for me some time ago for use in applying electrolysis to ingrowing eyelashes. The strength of current used is seldom more than 3 Ma., and should not exceed 5 Ma. The flattened platinum extremity is passed over the conjunctival surface of the eyelid; and it may also be introduced under the lid into the cul-de-sac. For this latter purpose, it is convenient to use it with the bend forward, as it is then easily made to

press against the eyelid and is kept away from the globe. A whitish frothy trail follows the platinum point which, after a time, becomes more tenacious and adheres a little to the instrument. The lower eyelid can also be treated, and the platinum end be carried over any part where granulations or thickening of conjunctiva are present.

"Cocain is freely used before the operation. The application even then is painful, but the pain ceases as soon as the operation is completed. For this reason it is preferred by those who have had both used, to the application of sulphate of copper. Nor does much irritation follow the employment of the battery in the way described. It may be repeated every few days, and several cases have had many applications. In one girl in which the granulations were very exuberant, so much so that extensive ectropion embracing the whole upper eyelid was occasioned, the electrolysis appeared to be of great service. The platinum probe was passed over the lid and well pressed on to the granulations, then it was turned on its side and drawn across the lid in lines. Expression with Knapp's forceps and also excision of some of the granulations had previously been practiced, and sulphate of copper had been applied, but the continuance of the electrolysis appeared to give the best results.

"In several chronic cases of trachoma electrolysis has been of benefit. One man who had formerly been treated elsewhere with blue stone, was very decided in thinking that the improvement was more rapid with the new method. It, like every other mode of treatment for the affection, requires time and frequent repetition, and it is suggested now more perhaps as an alternative than as a substitute for other methods."

Suggestions Regarding an Element in the Etiology of Trachoma.

STEVENS, GEORGE T., M. D., New York. (*The Ophthalmic Review*, September, 1897.)

The writer claims that anophoria is an element in the

etiology of trachoma. He recalls the principles respecting the normal planes of vision in relation to certain cranial types, this subject having been discussed in a recent paper (*Archives of Ophth.*, July, '97,) and this synopsis being necessary for the proper understanding of the present paper. These principles he states as follows:

“(1) With the type of skull known to craniologists as the “long skull,” the dolicho-cephalic, especially if the angle made by the three points, the glabella, the subnasal fossa, and the point of the chin is high, the axis of the orbit is directed downward, its depression averaging about 10° below the horizon and the direction of the visual lines, when the head is in the primary position and the minimum of nervous energy is directed to the eye muscles is correspondingly downward.

“(2) With the “broad skull” the brachy-cephalic, the angle formed by the points already mentioned being either very low or negative, the axis of the orbit is also depressed, but to a less extent than in the case of the long skull, and here, too, the normal direction of the visual lines is downward, but less depressed than in the case of the former type.

“(3) In the “medium skull” (the meso-cephalic), in which the transverse diameter is greater in proportion to the length than in the long skull, but less in proportion to the length than in the broad skull, but in general, with the proportion of the height of the skull to the length greater than in either of the other types, the axis of the orbits has a direction very materially higher on the average than in either of the other types, and here in very many cases the axis points many degrees above the horizon. The visual lines with this type of skull are normally directed above the plane of the horizon to the extent that, if we compare the rotation in the vertical direction of the eyes of a number of persons whose heads belong to the dolicho-cephalic type with the corresponding rotation of a number of persons of the meso-cephalic type, the result shows that the people with the long heads have an average restriction of the upward rotation of the eyes, and the people

with the meso-cephalic heads an average excess of upward rotation, and that if fifty or more of each type were to be examined by the tropometer an average difference of at least 15° of arc would be found between the upward rotation in the two types, the long heads having the least, and the medium or tall heads having the greatest rotation up.

“With these varying directions of the normal plane of vision there arise certain adjustments of the muscles of the head and face which are so habitual that they become characteristic for the types to which they belong. Thus, with the normal depression of the visual plane (the condition which I have called *katophoria*), common with the long head and prognathous face, there is a characteristic elevation of the chin while walking, and, what is especially opposite to our present purpose, the upper eyelids are prominently exposed and loosely applied to the surface of the eyeball.

“On the other hand, with the normal elevation of the visual plane above the horizon (the condition which I have called *anophoria*), a condition common with the tall head and orthognathous face, the forehead is carried in advance of the face while walking, the brow is strongly contracted, and pressed upon the upper lids, which are nearly concealed.

“This compression of the brows and pressure of the lids upon the upper surface of the eyeball are the auxiliary forces which are instinctively brought to bear to aid the proper depressor muscles of the eyes in performing the function of directing the visual lines downward, the direction they must usually maintain. The pressure of the upper lids in many cases of *anophoria* becomes extreme.

“It is this severe pressure of the lids upon the eyeball in cases of *anophoria* which appears to me to be an essential element of the production of *trachoma*.”

During the past two years, Dr. Stevens has tested nearly all of his eye patients with the tropometer, and he has found no exception to the rule, that with *trachoma* of the upper lids there is *anophoria* of a high degree, and in

every case of unilateral trachoma of an upper lid, there has been hyperphoria; that is to say, in all cases of upper lid trachoma, the eyes were found normally adjusted for a plane much higher than the most favorable, and that in unilateral trachoma not only are both eyes thus affected, but one is adjusted higher than the other.

The presence of trachoma in anophoria and its absence in katophoria in the cases observed by him might, he thinks, be suggestive without affording sufficient proof. He believes, however, that his views are strengthened by the observations of other individuals. He refers to the conspicuous absence of trachoma in the negroes, as reported by several American writers, and then cites the conflicting conclusion of Van Milligen, of Constantinople, that "all races are equally susceptible to the virus of trachoma," and that "immunity for certain races does not exist," this writer having found trachoma rife among the negroes who came to his clinic.

An examination of these two apparently conflicting conclusions shows that both are to a certain extent right, and that among the people with the dolicho-cephalic, or with the brachy-cephalic head, there is immunity from trachoma; while among the people with the meso-cephalic head, especially where the head is markedly high in proportion to the length, trachoma is endemic. Thus, inquiry has shown that trachoma does not exist in an endemic form in Bavaria and in surrounding country, nor in Switzerland, nor among the negroes of the southern part of the United States; the ancestors of these negroes came mostly from the west coast of Africa and they present the dolicho-cephalic head and a high degree of prognathism.

On the other hand, the testimony from Ireland, Italy and Japan, shows that inhabitants of these countries are by far the most susceptible to trachoma; in these people the characteristics of the meso-cephalic head are most marked, In the same manner, the negroes of Constantinople, a large proportion of whose ancestors were brought from central and south Africa, and who have high meso-cephalic heads and straight faces, with heavy low jaw and

compressed brow, are as much predisposed to trachoma as the most susceptible among the white races.

With this pressure of the lids upon the eyeball in anophoria, the writer adds an environment of dust and indifferent nutrition incident to poor and insufficient food as the most important elements in the production and increase of trachoma. He does not discuss the question of a specific germ for the affection, but says that if there is a specific germ or a contagion, it finds no favorable soil for its development in the absence of anophoria.

Regarding the results of treatment on these lines, Dr. Stevens says: "Although engaged only in private practice where one sees few of the more extravagant cases of trachoma, my experience during the past two years enables me to say that a change of the direction, of the visual plane by bringing it to correspond with that of the horizon, brings notable, and in some cases remarkable, relief to the trachomatous condition. Indeed, a number of cases of well-marked trachoma which have resisted the ordinary modes of treatment for years, have practically recovered within a few weeks after carefully executed corrections of the anophoric tendency without any important auxiliary treatment."

Potassium Permanganate in Ophthalmia.

STEPHENSON, SYDNEY, M. B., London, Eng. (*British Med. Journal*, November 20, 1897.) Report of the November, 1897, meeting of the Ophthalmological Society of the United Kingdom.

Mr. Stephenson communicated particulars of a case of purulent ophthalmia in a baby, where the frequent use of a strong solution of potassium permanganate had given rise to a deposition of manganese dioxide upon the cornea. The mark, which was of coal-black color, disappeared a few days after the use of the solution had been discontinued.

Cases of Ophthalmia Neonatorum.

✓ REILING, F. T., M. D., Kansas City, Mo. (*American Journal of Ophthalm.*, October, 1897.)

The writer reports fourteen cases of this disease with the object of showing that by careful examination of the discharge from the eyes, a great many cases were not due to gonorrhea. He noticed also that when gonococci were found in the discharge, the discharge lasted longer and was much more difficult to treat. In some cases in which no gonococci were found, the disease had been made worse by improper treatment, and got well rapidly under milder means. In making his diagnosis with the aid of the microscope, he depends not only upon the shape and size of the diplococci and the fact that they are inside the cell surrounding the nucleus, or inside of the pus-cell, but chiefly on their not taking on staining by the Gram method, since there are quite a number of diplococci that are nearly of the same size and shape, which are sometimes found inside the cell surrounding the nucleus, by accident or otherwise; but all such diplococci are stained by the Gram method, while the gonococci are not.

✓ **Treatment of Certain Corneal Lesions by Hydraulic Curetting with Sublimate Solutions.**

PLEASANTS, THOMAS, J., M. D., Helena, Mont. (*Amer. Journal of Ophthalm.*, October, 1897.)

After alluding to the unsatisfactory results in the treatment of a number of cases of corneal ulcer, the writer gives his experiences with hydraulic curetting with sublimate solutions, used during the past eighteen months in many cases, with eminently satisfactory results. He gives a summary of Dr. Santarnecchi's (Cairo) article which appeared in the *Annales D'Oculistique*, September, 1895, and describes the original method as follows: "He uses a syringe holding, say one ounce, and fitted to the syringe is a fine nozzle, which I should judge is about the same in calibre as an ordinary hypodermic needle. The syringe is

filled with 1:1000 sublimate solution. After instilling a few drops of a 1 per cent. solution of cocain, and waiting a sufficient time for its anesthetic effects, he separates the lids as widely as possible, and, directing the jet of sublimate solution against the ulcer or wall of the abscess, gradually increases the force of the stream until the last portion of the adherent ulcerated tissue is removed. He takes the precaution to instill a few drops of atropin solution in suspicious cases—that is, where he has reason to believe that the iris is involved, or in those cases where the opacity of the cornea is so great that it is difficult for the surgeon to ascertain the exact condition of the iris.”

The writer reports the histories of three cases which he considers fairly representative of the several classes of corneal injuries, from among a large number treated in this method. He concludes his paper with enthusiastic praise of the method.

Some Experiments on the Union of Corneal Wounds.

CLARKE, ERNEST, M. D., B. S., London, Eng. (*The Lancet*, October, 30, 1897.)

At the October, '97, meeting of the Ophthalmological Society of the United Kingdom, Dr. Clarke gave the results of some experiments on the union of corneal wounds, consisting of various operations on the cornea of rabbits, whereby the anterior chamber was completely emptied of aqueous with the view of ascertaining the time taken by these wounds in uniting sufficiently to allow the anterior chamber to be reformed. Descriptions of the methods adopted in operating and preserving the specimens were given. Two classes of experiments were performed. In the first class, the animal was kept under an anesthetic and killed. The anterior chamber was found to be present in two minutes, and fully re-formed in twenty-five minutes. In the second class, the animal was allowed to recover and, after varying intervals, ranging from half an hour to two and a half hours, again placed under an anesthetic and killed. The movements of the animal caused

some delay in the re-formation of the anterior chamber. The average time was one and a half hours. Wounds at the upper margin united most rapidly with less scar. Wounds across the center of the cornea and at the lower margin took longer to repair and made a larger scar. The rapidity with which the anterior chamber was re-formed suggested that, if during an operation on the eye where the presence of the aqueous was necessary, this aqueous were accidentally lost, the eye should be bandaged and the continuance of the operation postponed, only for half an hour at the outside, instead of postponing it until the next day, as was generally done. The experiments also showed the great influence that rest had on the process of repair, and emphasized the importance of keeping the patients absolutely quiet for the first few hours after an eye operation.

Inoculations in Tuberculous Iritis.

DENIG, RUDOLPH, M. D., New York. (*The New York Medical Journal*, October 9, 1897.)

The writer conducted a series of experiments in rabbits using extremely infectious cultures of tubercle bacilli, and also cultures artificially attenuated in their virulence, introducing these in a watery medium into the anterior chamber by means of a hypodermic syringe. For material, he used rabbits in different conditions of age and strength. He found that the physical condition of the animal had no influence at all upon the benignity or malignancy of the course of the tuberculosis.

"We find analogous conditions in human tuberculosis. In a previous publication I demonstrated that patients afflicted with ocular tuberculosis do not invariably exhibit a general scrofulous condition. Among 68 cases of tuberculosis of the human iris, ascertained by microscopic examination or inoculation, there existed no simultaneous tuberculosis of the body in 71, although among the latter, 27 were suspicious, and 4 presented signs of previous tuberculosis of other organs. But, excluding these 31 cases,

40 are left—nearly fifty per cent.—absolutely sound and healthy persons; from which fact we understand why in many cases, observed only from the clinical side, the diagnosis of lues was more frequently made than that of tuberculosis.

“Furthermore, the attenuation of my cultures was absolutely indifferent as to the intensity of the tuberculosis. The same picture of tuberculosis could be produced with attenuated as with very virulent cultures. Therefore the different intensity of reaction is not due to the bacilli, but to the susceptibility of the inoculated organ, viz., to the individual aptitude or immunity of the entire organism, or even, perhaps, of certain parts.

“It is a well known fact that tuberculosis of the iris in the human being, as well as in the inoculated animal, may heal, the small nodules especially often disappearing without any further damage to the eye. As to the metastasis and generalization of tuberculosis of the iris, in no instance did the tuberculosis of the inoculated rabbits become general. They remained under observation for about a year. This fact—though the percentage might be somewhat high—is especially interesting since it is contrary to the common views, according to which it was particularly noteworthy when the animal did not succumb.

“In accordance with my own views, these results prove that similarly the tuberculous processes in the human iris (and choroid) generally remain localized, and that we have to regard them in the same light as the local tuberculosis of the lungs, bones, glands and articulations. *

* * * * * In connection with this I stated in a previous paper, the rarity of metastasis in the eye from local tuberculosis of the lungs, articulations, etc. In only five cases did I see lesions of the choroid which might possibly have been tuberculous in nature, while 215 did not show any changes in the eye.

“Therefore, in cases of tuberculosis of the iris (and choroid) I would hesitate to perform an enucleation of the eyeball. It might be advisable only in cases of rapidly growing granulation tumors, which usually entail destruc-

tion of vision; but even in such cases, the fact has to be considered that metastasis may originate not from the tuberculosis of the eye, but from other structures as well; for instance, we know that tubercle bacilli are found in the glands of persons otherwise perfectly healthy."

Syphilitic Diseases of the Eye and Its Appendages.

JULER, HENRY E., F. R. C. S. Eng., London, Eng. (*The Lancet*, December 11, 1897.)

In the course of this lecture, which was the first of the Harveian lectures for 1897, Mr. Juler spoke as follows concerning chancre of the eyelid and its differential diagnosis: "The preauricular gland is always enlarged, firm and painless, and not tender unless manipulated roughly. I know of no instance in which in an undoubted case the former was not perceptibly swollen and hard. The absence of tenderness has a diagnostic significance. The diagnosis of primary syphilitic sores in this region constitutes one of the most interesting problems in surgery. It may be mistaken for any one of the following lesions: Rodent ulcer, epithelioma, lupus, chalazion, hordeolum, and tuberculous ulcer of the palpebral conjunctiva. Chancre of the eyelid is always accompanied by enlargement and induration of the pre-auricular or submaxillary gland, usually both; the absence, therefore, of glandular swelling will help to exclude many of the above affections. Thus rodent ulcer, tertiary syphilitic ulcer, lupus, and in most instances chalazion and hordeolum may be excluded, for in all of these the pre-auricular gland seldom, if ever, becomes enlarged. I have known both eyelids removed for suspected rodent ulcer; the growth proved to be epithelioma and yet the pre-auricular gland could not be felt. By the time that an epitheliomatous ulcer caused enlargement of the gland a chancre would have healed spontaneously and the sufferer be half through the secondary stage of syphilis. With suppurating chalazion and large suppurating styes the pre-auricular gland may be infected, but in some cases it is much swollen, painful, very tender, and

the skin over it is red and edematous. It is an acute lymphadenitis easily distinguished from a chronic enlargement. By a process of exclusion only one ulcer is left, the tuberculous ulcer of the conjunctiva, which is sufficiently rare to have been very much overlooked in literature. In my opinion this is the only ulcer that is likely to be mistaken for a chancre. The pre-auricular gland is firm and swollen and the ulcer is either round, or oval and saucer-shaped. Be suspicious if there is no induration at the base of the ulcer. A tuberculous ulcer, I have learned from experience, is never indurated."

Contribution to the Tréatment of Syphilitic Ailments of the Eyeball.

DR. JEHIN-PRUME, Montreal, Canada. (*The Ophthalm. Review*, October, 1897.)

After mentioning the promises which the serum treatment of syphilis holds out for the future, the writer reviews the different methods of administering mercury and calls attention to cases in which each of the ordinary methods are objectionable. He recommends the intravenous injections, used by him over two thousand times, and claims for these the following advantages: Stomatitis hardly ever occurs, the remedy acts very rapidly and produces none, or hardly any, of the general symptoms which are apt to be induced by the other methods of administering mercury. He believes, however, that such intravenous injections should be practiced only in serious syphilitic cases, where immediate results are required, when other mercurial treatment has given unsatisfactory results, and when other methods are not acceptable to the patient.

He employs the cyanide of mercury and is careful to prepare the solution in the following manner: One gram of the salt is dissolved in 100 grams of distilled and filtered water; this is placed in a sterilized ground-glass stoppered bottle. He recommends the Wulfling-Luer hypodermic syringe, made entirely of glass, instruments of

this description being the only ones which can be sterilized properly. He prefers needles made of iridized platinum; these can be sterilized by passing them through the flame of an alcohol lamp.

The manner of proceeding is described as follows: "You take a band of flannel (one meter in length by four fingers in width) which is bound tightly around the patient's arm; then make him keep his arm in a hanging position, moving the fingers the while so that the veins may get well filled with blood. The question of the venous system is a most important one in this treatment. The patient must have conspicuous, not filiform veins; otherwise it might be unwise to proceed with the injection. The reason for this is the danger there would be of injecting the liquid into the peri-vascular tissues and producing nodes or very painful abscesses. It is preferable in such cases to resort to frictions or subcutaneous injections. As to the choice of the vein, the most salient or superficial one is chosen. * * * * * You wash the part carefully with sublimate solution (1:2000) and then pass over it a pledget dipped in alcohol or ether. Then take the syringe and pass the needle through the flame of an alcohol lamp, draw into the syringe some of the solution to be injected, and again pass the needle through the flame and squirt out a few drops of the solution in order to expel the air which may be within the needle or syringe. This done, you ascertain by looking through the transparent springe whether it contains dust or air. The patient is told to keep his arm in a horizontal position, and the vein is pierced lengthwise (so as to avoid piercing it through and through). When the needle comes within the vein a sensation of non-resistance is felt. Before injecting, the bandage must be removed, then push the piston home, remove your needle and stop up the little wound with cotton wool dipped in collodion."

The dose is two and one-half centigrammes of the mercury cyanide to begin with, gradually increasing to one centigramme, which is the maximum dose. Regarding the frequency, the writer usually gave twenty injections, one

every other day, and then stopped for twenty days; then twenty injections, one every third day, followed by an interval of twenty days; then twenty injections, one every fourth day, and an interval of twenty days; and finally, one injection per week as long as deemed advisable.

Concerning the objections made against the intravenous method, from embolism and thrombosis, from foreign matter and air bubbles, he says that these dangers do not exist when suitable syringe and well prepared solution are used, and antiseptic precautions are taken.

Antiseptics in Eye Surgery.

NOYES, HENRY D., A. M., M. D., New York. *The Lancet*, September, 18, 1897. Report of the '97 meeting of the British Medical Association at Montreal, and *Medical Record*, October 30, 1897.)

Dr. Noyes introduced the subject of antiseptics in eye surgery, and related his experience and his methods in connection therewith. He stated that all were agreed that antiseptics were essential, and he described his method as to preparation for operations as follows: 1. A patient in hospital practice was given a bath, his clothes were cleaned, his head, eyebrows, and eyelashes treated with soap, hot water, and then with bichloride. The conjunctival sac was inundated with a solution of boric acid, which he considered was all that was necessary to wash away the mucous coagula. In some cases an occlusive bandage was used for twenty-four hours previous to the operation. 2. Instruments were boiled for from five to ten minutes in 4 per cent. carbolic solution and covered with an antiseptic cloth. In using jointed instruments extra care was required. In practice outside the hospital the instruments are boiled before going to the patient and then immersed in alcohol immediately before using. 3. The hands of the operator were cleansed by scrubbing with soap and hot water and powdered borax, particular care being taken as to the nails after which the hands were immersed in bichloride. 4. Dressings were sterilized

by steam and kept in a tight glass jar, and the wound dressed with a bichloride solution, 1 to 3000, for twenty-four hours. He had given up washing out the anterior chamber with iodide of mercury, and questioned if the normal salt solution was not the best. Asepsis was probably better than antiseptis in these cases. In private houses he had sometimes had suppuration take place owing to defective plumbing.

**On the Use of Epithelial Lip-flaps and Half-skin Flaps in
Eye Surgery.**

GIFFORD, H., M. D., Omaha, Neb. (*The Ophthalmic Record*, December, 1897.)

The writer recommends the use of epithelial lip-flaps for use in certain operations on the eyeball and lids. The flaps which he refers to correspond, for mucous membranes, to Thiersch skin-flaps. They are obtained by rendering tense the inner surface of the lip or of some other mucous membrane, and, with a sharp razor, cutting a flap so thin that only the epithelium and a very little of the adjacent tissue is removed. Such grafts he has found unrivalled for replacing ocular conjunctiva and in some cases, also palpebral conjunctiva. He prefers them to Thiersch's grafts, for the reason that skin, if it heals upon a mucous surface, remains skin, and does not become mucoid in character. As a result, the epithelial cells, not being exposed to the same friction as on the surface of the body, accumulate to some extent, also, decompose, thus giving an unpleasant appearance and slight irritation of the conjunctiva. Having found it difficult to obtain these thin lip-flaps, Dr. Gifford has had a special forceps constructed to facilitate exposure of the mucous membrane of the lip.

For certain operations he recommends the half-skin flap, by which term, he means one which is intermediate in thickness, between the Thiersch and the Wolfe flaps. These comprise more of the subjacent tissue and are about one-sixteenth of an inch in thickness. He believes

such grafts have a decided advantage over Thiersch's flaps or whole-skin flaps in operations for the cure of severe ectropion, and for replacing any extensive loss of skin of either lid, the advantages being that half-skin flaps offer much greater resistance to subcutaneous contraction, and are not as subject to surface necrosis.

Notes on the "Mules' Operation" Versus Enucleation.

BULLER, F., M. D., Montreal. (*Ophthalmic Review*, September, 1897.)

Since 1885, the writer has performed the operation of evisceration, with insertion of an artificial vitreous, a great many times, following for some years, as nearly as possible, the plan of operation as recommended by Mr. Mules, but the results were not altogether satisfactory. He found the reaction often intense, and is under the impression that the glass globe was subsequently extruded in about one case in three, due to the impossibility of maintaining asepsis during the healing process. This result Dr. Buller attributes to three causes: "(1) the circular aperture in the sclera could not be brought into perfect coaptation; (2) the catgut sutures were not sufficiently lasting; (3) there was no efficient means of preventing the conjunctival secretions from reaching the imperfectly closed wound." These considerations led him to modify the *technique* of the operation in the following manner:

"(1) Dissection of the conjunctiva for some distance around the cornea. (2) Removal of the cornea with a triangular portion of the sclerotic above and below. This large vertical aperture in the sclera permits a more perfect inspection of its interior, and facilitates the entire removal of its contents, and the glass globe can always be inserted without further enlargement of the aperture. (3) The scleral wound after insertion of the globe is united by five or six white China silk sutures, size 0.0., and these are cut short and allowed to remain. They are inserted through the entire thickness of the sclerotic, about one millimeter from the margin. This secures a perfect and

permanent coaptation of the scleral edges. (4) Three or four black silk sutures (size No. 1) unite the conjunctival aperture in a horizontal direction.

Thorough asepsis before, during and after the operation, is absolutely essential to secure uniform success. Some hours before the operation the face is thoroughly cleansed with soap and warm water, and with a solution of perchloride of mercury, 1 in 2,000; the conjunctiva with 3 per cent. warm solution of boracic acid. The closed lids are then bandaged with a dressing of absorbent cotton freely dusted with fine boracic acid powder. The same cleansing process is repeated before the operation. The contents of the sclerotic are always removed with a Volkman's spoon, and the cavity scraped clean with the same, and freely flushed with the perchloride solution 1 in 2,000. Solutions of the perchloride 1 in 1,000 irritate the conjunctiva more than is desirable; the weaker solution is, therefore, to be preferred. I do not wait for all bleeding to cease before inserting the globe, as it is not at all necessary, and prolongs the operation very much.

When all the stitches have been inserted, the conjunctiva is thoroughly cleansed with boracic acid solution and the stump dusted with iodoform powder. An absorbent cotton compress dusted with the same, and a compressure bandage complete the dressing. This dressing is not removed before forty-eight hours. If there is then much reaction, swelling and pain, I use ice cold perchloride compresses, frequently changed, for two or three days. If not, the eye is cleansed with boracic acid solution and dressed as before, once daily. In from five to seven days the patient is practically well.

"The records of the last ten cases treated in this way, show that nine were perfectly successful. One failed, but in this case I was not surprised at my non-success. It was a small shrunken eye, and no glass globe could be obtained nearly small enough; a large gold bead was used instead, and even with this the scleral edges could hardly be united. It came out at the end of four weeks.

"If the glass globe should unfortunately become ex-

truded, there is still a better stump than that of enucleation.

"I have not performed this operation in any case of acute suppuration of the eyeball, or in any case where sympathetic ophthalmia was present or seemed imminent, or in any case of sarcoma of the choroid, and I do not think it advisable where the eyeball is very much shrunken. In all cases I believe it is very much preferable to enucleation, simple evisceration, or optico-ciliary neurotomy. I used to perform this latter operation occasionally as a substitute for enucleation, but never shall again, since I have once seen it followed, three months later, by total loss of the other eye from sympathetic ophthalmia.

"Besides the cosmetic advantage gained by the better stump for wearing an artificial eye, the Mules' operation gives a healthy conjunctiva, which is not in the state of chronic irritation from retained secretions so often seen after enucleation, and therefore not so liable to ulceration and cicatricial changes. Until I discover some good reason for changing my opinion, I shall continue to regard this operation with unqualified approval."

**The Insertion of an Artificial Globe Into Tenon's Capsule
with Preservation of the Function of the
Ocular Muscles.**

MORTON, HOWARD MCL., M. S., M. D., Minneapolis, Minn. (*New York Medical Journal*, October 30, 1897.)

This operation is not proposed as a substitute for Mules', but as a method applicable to two classes in which Mules' operation cannot be used: cases in which the eyeball is atrophied but the power of the muscles is more or less retained, and cases in which from severe injury the coats of the eyeball are so severely lacerated, that only complete enucleation is feasible.

The writer presents the history of a case in which he performed this operation: A sightless, shrunken eyeball became painful and caused sympathetic irritation of the fellow eye; its removal became, therefore, imperative. A

circular incision was made in the conjunctiva close to the limbus, and each of the recti muscles was carefully dissected from the surrounding tissues and then cut close to the sclera, having been previously secured by double-needed catgut suture. The globe having been removed and hemorrhage stopped, a glass sphere was inserted into the cavity formed. The sutures attached to the external and internal rectus were tightened, and then the same process applied to those of the superior and inferior rectus. The muscles were thus made to lie upon the anterior surface of the sphere and held in position by the catgut passing between the two pairs. The catgut sutures were finally secured by a knot which occupied exactly the center of the anterior surface of the sphere. The catgut sutures and the sphere were then covered by the conjunctiva, which was then closed with interrupted silk sutures. The muscles thus held in position became adherent to the overlying and surrounding conjunctiva, this union being completed before the catgut was absorbed. The reaction following the operation was very slight and the result was very satisfactory, and a great improvement, from a cosmetic standpoint, over the ordinary enucleation.

The Hyperdermic Use of Pilocarpin Alone, and Associated with Other Medicines in the Treatment of Certain Affections of the Eye.

BURNHAM HERBERT, M. D., F. R. C. S., Edin., M. R. C. S. E. Toronto. (*Ophthalmic Review*, September, 1897.)

The author is very enthusiastic in his praises of this remedy, used hyperdermically, in rheumatic affection of the eye, syphilitic irido-cyclitic and gonorrheal irido-cystitis. He gives the histories of one example each of these affections to illustrate the favorable action of the remedy. His conclusions are based upon observations continued over seven years. His procedure regarding the pilocarpin is as follows: "I give it in the afternoon and keep the patient in the house afterward, not allowing him to leave it until the next day, when in suitable cases he can go out and take exercise, sometimes even follow his occu-

pation. Just prior to giving the injection he is put to bed, lying between flannel sheets and dressed in a flannel suit. The temperature of the room is about 75°. The covering over him is a blanket well tucked in. In a few cases where, under the influence of the drug, the feet become cold, I place a warm bottle to them. The patient holds to his mouth a large cup to catch the saliva that flows freely. The solution is pilocorpin muriate gr. v. to aq. distill. 3i, *i. e.*, gr. 1-4 to m. iii. It is injected into the forearm, and the amount being small in quantity makes the subsequent tenderness very slight. He remains in bed for one and a half to two hours, and, on getting up is wiped down with warm towels, and is then free to go about the house, but not to go out till, in suitable cases, the following morning. Eight weeks I have found clinically to be the highest interval between each group of injections that can be profitably allowed, and three weeks the shortest. But this latter interval is only made use of at the beginning of the treatment. Later on the interval is extended to six or eight weeks. It is very necessary not to cause intolerance of the drug, but at the same time important to use it as fully as it can be borne." Dr. Burnham favors the use of pilocarpin injections alone or combined with other remedies indicated in the affections already alluded to. In retinal and retino-choroidal affections he believes that the combined method will prove to be more reliable and satisfactory than the universal measures now used.

A Report on Holocain as a Local Anesthetic in Ophthalmic Work.

DRS. H. V. WURDEMAN and NELSON M. BLACK, Milwaukee, Wis. (*The Ophthalmic Record*, October, 1897.)

The writers tried the anesthetic upon themselves with the following results: "Anesthesia was produced in fifteen seconds with two or three drops of a one per cent. solution, lasting ten minutes and upward; the application was attended by a slight smarting that lasted for about thirty seconds, but no more than from cocain, followed by a sen-

sation of coldness and slight moisture which lasted for several hours. The lids were squeezed slightly at first, due, probably, to irritation of the sympathetic; an increased hyperemia of the blood vessels of the conjunctiva was noticed in all cases which lasted from one half to one hour. The cornea was moist and did not dessicate. The tension was not noticed to have been diminished as suggested by some experimenters. No action on pupil or accommodation was noticed in any case. Anesthesia lasted from 12 to 15 minutes." Then follow brief reports of the use of this new anesthetic in 30 operations of various kinds, in all of which the relief from pain was as satisfactory as with cocain. The conclusions are: "The advantages of the anesthetic are: its nontoxic action in local use, the stability and bactericidal quality of its solutions, the rapidity and completeness with which it produces anesthesia, the length of time the anesthetic lasts, the nondilation of the pupil, making it especially useful before applying irritating applications, as no unpleasant blurring of vision is noticed afterward, and the ready absorption of the drug, enabling deeper operations to be performed. The drug is used in one-fifth of the strength of cocain and is proportionately already cheaper. The only toxic effects that have been observed were in its use hyperdermically, it producing clonic spasms like those of strychnia, when injected under the skin of animals."

Holocain vs. Cocain.

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 Horz, F. C., M. D., Chicago, Ill. (*Journal of the Amer. Med. Assoc.*, November 13, 1897.)

The writer made a number of clinical experiments comparing the anesthetic value of a one per cent. solution of holocain with a two per cent. solution of cocain. In normal eyes and eyes with foreign bodies, holocain caused more or less smarting and burning, lasting half a minute, and considerable redness of the conjunctiva, both ocular and palpebral, which lasted during the entire period of anesthesia. Complete anesthesia of the cornea was noted

in from one minute and a half to two minutes and sensibility of the cornea began to return in six minutes, a second instillation prolonging the anesthesia for another five minutes; and if another drop was instilled the condition could again be continued; in this way it would seem that the effects could be kept up indefinitely. Holocain did not contract the conjunctival blood vessels and caused neither bleaching of the eye, lessening of the lacrymal secretion nor drying of the corneal epithelium. It did not dilate the pupil nor affect the accommodation. But the anesthetic effect of a two per cent. solution of cocain was found to be more penetrating and more thorough than a one per cent. solution of holocain. The application of the electro-cautery to a corneal ulcer was painful under anesthesia with holocain, and the cutting and suturing of the muscle in a case of advancement was decidedly painful in a holocainized eye, while scarcely felt in a cocainized case. From these observations Dr. Hotz concludes that holocain is a very quick but very superficial anesthetic; a very useful agent for the removal of foreign bodies from the cornea and for operations upon the conjunctiva; but he regards cocain as the more reliable for the deeper operations and especially for those which involve the opening of the globe.

Thiosinamine—A Further Study of Its Use.

TOUSEY, SINCLAIR, A. M., M. D., New York. (*New York Medical Journal*, Nov. 6, '97.)

The writer refers to a previous paper of his in which he gave the favorable results in the treatment of keloid by means of this remedy injected hyperdermically. The drug is derived from oil of mustard seed; it is one of the remedies experimented with in the hope of finding a cure for tuberculosis, having been employed for this purpose by a number of competent authorities. It was found to have no curative influence upon tuberculous processes, but such experimentation led to the discovery of its property of causing the softening and relaxation of deforming cicatrices left by lupus and the consequent cure of extreme

cases of ectropion and the like. Its hyperdermic administration produced an immediate disintegration and elimination of white blood-cells, so that the number present fell to one-third the normal, followed for forty-eight hours by a leucocytosis. The writer believes that this action explains its effect upon keloid, the cellular activity in the circulating medium calling forth a co-ordinate activity in the leucocytes and fixed connective tissue cells throughout the organism, and an increased removal of effete or lowly-organized material by way of the blood and lymph channels.

Concerning its use in corneal opacities the writer says the following: "My advice has been asked concerning its use in corneal opacities. I should inject twelve minims of the solution (ten parts in one hundred parts of sterilized water and glycerin), into the triceps every three days, and continue with the same dose until at least twenty-seven injections had been given. Marked improvement in vision may be promised, but the improvement in appearance is not so striking. In every case, therefore, this treatment should be used for definite and serious impairment of vision, and the acuteness of vision should be carefully measured and recorded before and after treatment. An observation of my own, recorded in this paper, will show my reason for believing that any benefit obtained in the absorption of cicatricial tissue, or the like, by this drug is a permanent one. As mentioned in my first article, a number of cases of corneal opacities have been successfully treated by Hebra and by Richter. In a case reported by the former the patient, before treatment, could hardly avoid collisions with people on the street, and afterward could read the time by the high City Hall clock (Rathhaus Thurm), in Vienna. Hebra states that a large number of cases of mild impairment of vision from corneal opacity have been entirely cured by treatment with thiosinamine at the Rudolphspital, Vienna. A recent case communicated to me by an oculist in Philadelphia showed very marked improvement in vision."

The writer records one example in which death occurred

from septicemia following the hyperdermic injection of this remedy. He attributes this to the method used, and not to the remedy. In a recent case he administered the remedy by the mouth—three grains in capsule every day for eight weeks—without any disturbance and with the therapeutic result sought for, and he sees no reason why this method of administration may not be the best one.

Reverting to corneal opacities, he says that the use of thiosinamine should be limited to cases in which there is no danger of fanning a latent inflammatory process into an active one. He mentions that one of his correspondents reports the cure, or clearing up, of a cataract under this treatment (one case). The balance of his paper is devoted to a consideration of the results of the use of the remedy in keloid, inoperable malignant growths, and in certain forms of deafness, in all of which good results are reported.

Painless Eye Operations.

BATES, W. H., M. D., New York. (*New York Medical Journal*, Oct. 16, '97.)

The writer again calls attention to the value of a solution of the extract of the suprarenal capsule as a supplement to cocain. He says that the latter does not prevent pain in many tenotomies and advancements, and in most lachrymal operations, and that inflamed eyes resist the action of cocain. During the past three years he has operated in more than one hundred cases in which the extract was as necessary as cocain in securing complete anesthesia. He has operated upon inflammatory glaucoma painlessly, using the suprarenal extract to relieve the congestion, so that cocain was able to anesthetize. He states that Darier, of Paris, has since reported painless iridectomies in these cases from the use of the suprarenal extract and cocain. He claims that the extract is not objectionable in any way, being neither irritating nor poisonous; it is merely a powerful astringent. The solution must be properly prepared. The dried glands may be obtained from Armour & Co., Chicago. The solution is pre-

pared by mixing about ten grains of the dried extract powdered gland with half a drachm of water, and filtering; it must be prepared just before the operation, since it soon spoils when exposed to the air at the ordinary temperature. Nothing else should be mixed with it. A few drops are used alternately with the cocain solution.

The writer also advocates the use of a hot salt water (5 1 to one pint), douche, about 115 degrees, to the operated part of the eye as soon as the operation is finished, while the eye is still under the influence of cocain. He uses a fountain syringe and employs about three quarts of water. He claims that this prevents the occurrence of pain and soreness after an operation.

The Utility of the X-Rays in Detecting and Locating Metallic Particles in the Eye.

KIBBE, A. B., M. D., Seattle, Wash. (*Archives of Ophthalmol.*, Oct., '97.)

Dr. Kibbe relates his experiences with the X-ray apparatus in five cases in which a piece of metal had penetrated the eyeball and could not be located by other means. He found that accurate localization was possible. Regarding the form of apparatus, and the technique, he says: "Coils giving from six-inch to ten-inch sparks in air are large enough, if the tube is a good one and has a sufficiently high vacuum. Ten minutes' exposure with a good tube, excited by an eight-inch-spark coil, should be ample, and very good skiagraphs of the bones of the face may be obtained in half the time. The tube should not be placed closer than eight inches from the side of the face, and twice that distance if examination by the fluoroscope shows a fairly good outline of the boundaries of the orbit and antrum. The sensitive plate, either securely wrapped in light proof paper or placed in a plate-holder, should be strapped to the side of the face corresponding to the eye examined, either by adhesive plaster, or by a light bandage. Large rubber bands I have found very convenient. The patient should be in an easy position, with the head

inclined backward and resting against the head of a chair, which should be high enough to support the head. The eyes should be gently closed. This is absolutely necessary to good results. If allowed to remain open it is absolutely impossible for the patient to keep them fixed on one object for the length of time necessary to take a good skiagraph. The tube should be so placed that the center of the platinum plate will be in a line joining the temporal edge of the orbits. Any good sensitive plate answers our purpose, and I have found no great difference between rapid and slow ones. Those individually wrapped, such as are especially prepared for X-ray work by Carbutt, are very convenient and give excellent results."

These directions give a fairly clear indication of the depth of a foreign body and certainty of its presence, but do not enable us to locate it accurately. In order to discover some method of doing the latter the writer made numerous experiments, of which those about to be described were successful: "A plate closely wrapped in black paper was placed against the temple and firmly fastened by bandage or adhesive plaster. The tube, in an adjustable holder, stood twenty inches from the plate. Measurements were made from the platinum. The center of the latter was placed as nearly as possible in a line joining the temporal edge of each orbit. A four-minute exposure having been made, the current was shut off, the tube lowered four inches, and the plate again exposed to the rays four minutes more. In this way two images on the same plate were secured which were separated to a degree equal to the angle formed by the lines emanating from the center of the platinum. A simple mathematical calculation will then give the exact distance of the particle from either the tube or the plate. An easy method of applying the measurements to the head is to use two cords adjusted to correspond to the imaginary lines drawn from the center of the platinum in the tube to the sensitive plate. Placing them in front of the face, with their extremities corresponding to the tube on the one side and the plate on the other, the point where they cross will show the position of the particle."

As a result of these experiences, the writer considers himself justified in drawing the following conclusions: (1) Foreign bodies of metallic nature, other than aluminum, may be detected in the eye in all but very exceptional instances. (2) Their location may be determined with sufficient accuracy to guide us in operative procedure for their removal. (3) Success will depend, in great measure, on the character of apparatus employed, the skill and experience of the operator, and adherence to the rules given for the position of the patient. (4) Long exposures, with tubes excited by small coils, should be avoided, owing to the danger of exciting dermatitis.

The Roentgen Rays in Ophthalmic Surgery.

✓ SWEET, WILLIAM W., M. D., Philadelphia. (*Journal of the Amer. Med. Assoc.*, Jan. 1, '98.)

The writer points out the fact that the surgeon who contemplates using the electro-magnet for removal of certain foreign bodies from the eye must not only know that such a foreign body is in the eye, but must have some information in regard to its position. The ordinary radiograph does not accurately indicate the position of the shadow of the foreign body on the plate in relation to the shadows of the bones of the head. Dr. Sweet describes the experiments made by Lewkowitch to determine this point, and, following this, gives an account of his own efforts in this direction, the photographic plate having been inserted at the inner canthus. But while this has the advantage of bringing the sensitive film much closer to the eyeball, an important point when dealing with very small objects, it has the disadvantage that the whole eyeball is not included on the plate; hence, he has since used glass plates bandaged to the temple. Two objects of known position are employed to locate the situation of the third (the foreign body) from the shadows cast upon the plate; how this is done is explained in detail in Dr. Sweet's paper.

The histories of two cases in which these methods successfully located the situation of a foreign body in the eye-

ball are given, and also a third in which, although, the ophthalmoscope apparently indicated the existence of a foreign body in the eye, the Roentgen rays failed to show it upon the plates. The last example induced him to make a number of experiments to determine: 1. Whether very small metallic bodies in the eye could be located by means of the Roentgen rays. 2. To what extent the bones of the orbit interfered with the passage of the rays. 3. The character of the tube and the vacuum at which it should be operated to give the best results; and 4, the best point at which to place the tube.

These experiments seemed to leave no doubt as to the great superiority of the small focus point tube as compared with that of large focus, the shadow of even the finest wire being distinct when made with the former, and blurred and indistinct when made with the latter. The bones of the orbit obstructed the rays to a very small degree, the shadow of steel wires being perfectly distinct throughout the entire extent of the external orbital wall, notwithstanding the greater thickness of the bones where the frontal joins the malar. The best results were obtained when the tube was run at high vacuum so that there was great penetration of the ball and the muscular and bony structures. In the experiment with small bodies in the eye, the superiority of the small point focus tube was again shown. The time of exposure was varied from two to six minutes, four minutes appearing to give perfectly satisfactory results; in one instance an exposure of thirty-five seconds gave a negative with excellent detail. Both X-ray plates and rapid landscape plates were used, the latter being as satisfactory as the former, and requiring much less time in developing and fixing.

The Roentgen Rays in Ophthalmic Surgery.

HANSELL, HOWARD F., A. M., M. D., Philadelphia, Pa. (*Amer. Jour. of Med. Sciences*, November, 1897, and *The Journal of the Amer. Med. Assoc.*, January 1, 1898.)

The writer reviews the reports of what has been done by

means of X-rays in the department of ophthalmology. During the past winter, in operation with Dr. Stern, he made a number of efforts to determine whether the rays had a beneficent or injurious action upon diseased and healthy eyes. "It was found in cases of opacity of the media, such as leucomatous corneæ, capular and lenticular cataract, that no improvement whatever could be noted either in the disease or in the ability of the patients to see clearer through the fluoroscope than without it. In a case of nearly absolute central scotoma due to a large patch of central retino-choroiditis, repeated exposure to the rays as they were emitted from the tube gave the same negative result. The findings in cases of atrophy of the optic nerve were equally discouraging. * * * No cases of injury to the tissues of the eye from the action of the ray, even under the former prolonged exposures, have been published, and now with improved apparatus the danger of burning the skin or producing destruction of the hair-bulbs is insignificant."

The histories of two cases are given, in both of which skiagraphy demonstrated the presence and approximate location of pieces of metal within the eyeball.

Physiological and Hysterical Diplopia.

✓ DR. LIEBRECHT, Hamburg, Germany. (*Archives of Ophthalm.*, October, 1897.)

The writer bases his conclusions upon the examination of 50 dispensary patients of all ages. He gives the histories of a number of cases to serve as examples, and concludes his paper with the following summary of the individual characters of physiological and hysterical diplopia:

I.—PHYSIOLOGICAL DIPLOPIA. 1. *In almost all men the presence of double images in certain directions of the gaze can be demonstrated by suitable tests. Such diplopia never occurs spontaneously when the eyes are being used in the natural way.*

2. *Such diplopia never occurs when the gaze is directed straightforward, but only when the eyes are rotated—and*

generally only when they are rotated very far—in the different directions.

3. The double images are almost always *homonymous*, and are so too for directions of the gaze both up and down.

4. *Physiological diplopia depends upon the fact* that in the associated lateral movements of the eyes, the power of either eye for turning inward exceeds its power of turning outward. Such diplopia occurring in the course of movements up and down depends upon the difference shown by the two eyes in the ability to make excursions in these directions.

II.—HYSTERICAL DIPLOPIA. 1. Hysterical diplopia produces *spontaneous* double vision, which, however, occurs only at times and causes the patient very little trouble.

2. The double images may be *either crossed or homonymous*. In either case, they are present *when the gaze is directed straightforward*.

3. The phenomena of the diplopia *do not agree with those of paralysis of an eye muscle* due either to a peripheral or a nuclear affection of the nerves.

4. *The relation of the double images is inconstant*. Separate examinations, even though made close together, give varying results.

5. The diplopia is to be regarded as due to an *affection of the centre for voluntary associated movements, i. e., an affection of some region in the cerebral cortex.*"

Heridity and the Development of Myopia.

WRAY, CHARLES, London, End. (*British Medical Journal*, November 20, 1897.) Report of the November, '97 meeting of the Ophthalmological society of the United Kingdom.

Mr. Wray began by stating that some observers found a family history in as many as 60 per cent. of their cases of myopia. On the assumption that one-fourth of the hereditary tendencies were from each parent, and one-sixteenth from each grandparent, it was plain that hereditary predisposition would appear more and more in the etiology

of myopia. He questioned the expediency of using the term "acquired myopia" lightly, as no case could legitimately be called acquired, unless ancestral myopia could be disproved, which the author contended was impossible. He next submitted that authorities repudiated the possibility of the transmission of acquired structural peculiarities, and experimental evidence was quoted to the effect that the removal of an eye in rabbits during many successive generations failed to cause the birth of one-eyed offspring. The author conceded the transmissibility of ordinary myopia, and then stated that there was no relation between the sum of the myopia of myopic parents and the amount that would appear in the offspring, and when the highest grades had been found the parental myopia was invariably confined to one parent. Since Fulkala's operation had come into vogue, the author had given special care to the investigation of the antecedents of such patients, and found in a considerable number of cases that the child with very high myopia had suffered from protracted infantile marasmus, whilst the brothers and sisters who escaped, had not. He further stated that out of 126 cases of myopia of over 10 D., he had not found one instance in which parent and child were both subject to an equal, or approximately equal amount. The existence of the highest grade of myopia in one eye only made it exceedingly probable that other influences acted as powerfully as marasmus in the predisposed. Since such grave disproportions never arose in the limbs during their development, it was necessary to consider the difference in their development, and this was to be found in the way in which the vitreous was formed by the passage of mesoblastic elements into the secondary optic vesicle. Mr. Wray suggested the possibility of hypoinclusion being the basis of hypermetropia and excessive inclusion the cause of myopia. He alleged that this theory would explain the variation in the age at which myopia appeared, and the phenomena of stationary and progressive hypermetropia and myopia, as well as numerous other points in the pathology of myopia.

**On the Occurrence of Retinal Hemorrhage After Middle Age
and Its Bearing on the Duration of Life.**

DERBY, HASKET, M. D., Boston, Mass. (*Boston Medical and Surgical Journal*, July 22, 1897.)

The writer relates the history of a case of retinal hemorrhages occurring in a man of sixty, actively engaged in public life, who had been warned to regard the disease of the eye as a forerunner of something worse, and to change his course of life; this advice was not followed, and twenty months afterward he had an attack of apoplexy which proved fatal. This history serves as an introduction to the paper. Dr. Derby points out the fact that the subject of the connection of retinal hemorrhage with the condition of the general health is not dwelt upon by writers of ophthalmology at any length, and is ordinarily dismissed in a few words, all the authors, however, agreeing that, occurring in the aged, the symptom is an ominous one. While the effect on sight may be slight, it has a significant bearing on the duration of life. It may mean an atheromatous condition of the cerebral arteries, or a cardiac lesion. The symptom is of great importance, and the prognosis serious. The detection of the disease is easy. The cases are far from infrequent; and the warning given by their occurrence may be practically utilized for the regulation of important business interests and to prolong life.

After reciting the difficulties of following up these cases, he continues with a tabular statement of thirty-one cases which he succeeded in tracing out of ninety examples of retinal apoplexy recorded in his records during the past two years. Reviewing these thirty-one histories, he says: "We have here a total of 31 persons, between the ages of 43 and 83, subjects of retinal hemorrhage; 25 of these died after brief illness, some, indeed, with the utmost suddenness. Eleven of this number died of heart disease, fourteen of apoplexy. Five were, at last accounts, living, their average age being fifty-four, and their cases followed up an average of thirteen years. Another, a man of

eighty-three, died, six years after he came to me, of an affection of the bladder.

“While, therefore, the effusion of blood in the retina cannot be said to uniformly portend danger to life, it has certainly a grave significance, increasing directly with the age of the patient. That it is often overlooked there can be no question. * * * * *

An early diagnosis, and the consequent recognition of the possibility of sudden death, not only leads to the settlement of business interests that, in the event of an unexpected demise, might seriously suffer, but causes advice to be given that may sensibly prolong the days of the patient. Auscultation, thus suggested, may detect the presence of an hitherto unsuspected cardiac lesion. And in any case suitable diet, leading a regular life, and above all, the avoidance of exhausting work or excessive mental activity, have lengthened many a life thus threatened.

“* * * * * These cases must, of course, be referred back by the specialist to the family physician to whom, indeed, their diagnosis ought to be by no means impossible. The patient is generally advanced in years, vision is suddenly impaired, and in a single eye, a general mist or blur being the symptom complained of. Cataract makes its presence more gradually felt, while glaucoma can be recognized by the tension of the eyeball, the enlargement of the pupil, and the characteristic encroachment on the visual field. If there is no reason to suspect either of these diseases, a retinal hemorrhage is, under the circumstances already mentioned, at least probable. To enlarge the pupil, which is ordinarily necessary, a weak solution of scopolamin may be used and the degree of familiarity with the ophthalmoscope, which now does or should enter into the training of every physician, enables the observer to make a certain diagnosis.

The Localizing Value of Optic Neuritis in Intracranial Tumors.

MARTIN, J. M., B. A., M. B., B. C., London, Eng. (*The Lancet*, July 10, 1897.)

During the last thirty years general opinion has wav-

ered greatly as regards the certainty and frequency with which optic neuritis is produced by a growth within the cranium, and the greatest authorities from time to time have made diametrically opposite statements with regard to this condition. At various times it has been stated that optic neuritis has no localizing value as regards the seat of disease, and at other times the directly contrary opinion has been put forward. Thus Dr. Hughlings Jackson, in 1880, stated that "optic neuritis is of no value in localizing disease in any part of the cerebrum or cerebellum," and Dr. Horsley now holds that optic neuritis is of distinct value in locating the position of the disease, more particularly as regards the side on which the disease is situated. But it is when we come to the question of unilateral optic neuritis that we find the greatest difference of opinion. For some observers state that in a case in which optic neuritis appears only in one eye, or appears in one eye before the other, or is more marked in one eye than in the other, the seat of lesion is on the opposite side of the brain; whereas others equally positively state that the lesion is on the same side as the eye in which the optic neuritis first appears or is more marked. It is as an attempt to try to arrive at the true facts of the case by examining rather a larger number of reports than has been presented before that I now bring forward the results of my analysis of 600 cases, which I have collected from various sources."

The writer gives a general analysis of his series of cases according to sex, nature of tumor and position of tumor. He gives a table showing the chief position of the headache in each case, the result confirming the prevailing idea that the position of the headache is of no value in determining the position of the tumor.

"The results of my analysis of these 600 cases as regards the presence of the optic neuritis are in accord with the generally accepted statements, but I have gone rather more into detail than has usually been the case; thus I have separated the cases in which optic neuritis was noticed into four groups, with the idea of seeing whether any new facts could be brought out; these groups are: (1) those cases in which the optic neuritis was stated to be unilateral; (2)

those in which the optic neuritis was beginning late in the course of the disease; (3) those in which the optic neuritis was early and marked; and (4) those in which the optic neuritis went on to atrophy or in which atrophy was first noticed." A comparatively small number of cases were found to have developed atrophy in tumors of the pons, medulla, tempora-sphenoidal lobe, motor area, corpus collosum and corpora quadrigemina. Optic neuritis was constantly present in tumor of the corpora quadrigemina so that absence of neuritis excludes this position of an intracranial tumor; next in frequency of optic neuritis came the cerebellum and parieto-occipital regions (39 per cent.) A comparatively small proportion of cases of optic neuritis occurred with tumors of the corpus callosum, pons and medulla.

Analyzing the table of cases in which optic neuritis was unilateral or more marked on one side than on the other he found 55 cases useful for this purpose; "there are quite sufficient data to justify one in stating absolutely that the seat of the lesion is probably on the side on which the optic neuritis is more marked in the proportion of 71 to 29."

Turning to the question of the effect of the nature of the tumor in producing optic neuritis, he finds that the latter is most often absent if the growth is tuberculous and most frequently present if the tumor is a glioma, is cystic or is a hydatid.

Statistics are given showing the relation of strabismus to cases of intracranial tumor; 30 cases were analyzed; internal strabismus existed in 27 of these and was on the same side as the tumor in 24. Hence in cases in which internal strabismus is noticed the tumor is generally on the same side.

Diagnosis and Treatment of Affections of the Frontal Sinus.

FEHLEISEN, F., M. D., San Francisco, Cal. (*Medical Record*, Aug. 7, '97.)

The author gives the causes of affections of the frontal sinuses and differentiates between the different forms,

discussing the various symptoms and the question of diagnosis. He then takes up the treatment and details the various steps contributed by successive operators. He insists upon the operation being radical, and describes the technique as follows, agreeing, in the main, with Nebinger and Kuhnt:

"As regards the point of chiselling, most operators recommend a place corresponding to the inner end of the eyebrow. It is at the intersection of two lines, one of which connects the two incisurae supra-orbitales, the other being drawn perpendicular to the first from the crista lacrymalis anterior. The point lies at the margo supra-orbitalis perpendicularly over the ligamentum palpebrae. Nebinger advises to begin chiselling at the os nasae. I must confess that the fear which many have of opening the skull gives me little worry. In general, the frontal bone consists of a tabula externa and a tabula interna, with spongy bone between. The anterior sinus wall consists solely of tabula externa; so, if one chisels carefully, one can hardly enter the cranial cavity, as one will see the spongy bone and be warned. Having chiselled through the sinus wall, the mucous membrane will appear as a dark red, or, perhaps, discolored yellowish, or black cyst, provided that it has not been destroyed by gangrene.

"Not infrequently the sinus contents pulsate, which in no way points to a defective posterior wall of the sinus, but, as Boeckel showed, is always present when a bony-walled cavity is opened in which there are tissues containing many vessels. Such pulsations have been noted also in the antrum of Highmore and in the narrow canals of bones. After opening the sinus one determines the size of the cavity by means of a sound, and then removes the anterior and possibly part of the inferior wall. The sharp edges of the bone are bevelled off, and one tries to make, instead of an irregular cavity, as flat a surface as possible. The more closely the skin is adapted to the subjacent bone, strictly avoiding the formation of a pouch, the more rapidly will the healing occur. The mucous membrane is thoroughly removed, the upper part of the ductus nasolacrymalis being also robbed of its mucous membrane. If this is

closed it is unnecessary, nay, even harmful, to open it. Formerly, when one did not primarily remove the mucous membrane, it was of course necessary to establish a communication with the nose, either by passing a sound through the ductus naso-frontalis, or by breaking into the nose, in order to give the secretions an outlet.

"If one obliterates the cavity in the above-described manner, however, the ductus naso-frontalis not only becomes superfluous, but its artificial opening may do harm by allowing inflammatory products from the nose to come in contact with the wound. The after-treatment is to be in accordance with the ordinary rules of surgery. Even when one has operated in strongly inflamed tissues and cannot sew, there results, at worst, after this operation, a small abscess cavity, the absolute healing of which is but the question of a short time."

ABSTRACTS FROM RECENT FRENCH OPHTHALMIC LITERATURE.

BY CHARLES A. OLIVER, A. M., M. D.

PHILADELPHIA, PENN., U. S. A.

ASSISTED BY HENRY G. ROTHROCK, M. D., OF WEST CHESTER,
PENN., U. S. A.

QUARTER ENDING DECEMBER 31, 1897.

The Purse String Suture of the Conjunctiva, in Cases of Solution of Continuity of the Cornea.

ROHMER, M., Paris. (*Annales d'Oculistique*, November, 1897.)

Rohmer cites twenty-three cases of the above nature treated by himself with the purse string suture of the conjunctiva, according to the de Wecker method, and one treated by Meyer's method of conjunctival transplantation, with but one failure. He also adds two cases previously reported by Meyer, one by Weiss of Heidelberg, one of a burn of the ciliary region by Norman Hansen, and one of a corneal fistula seen by Bourgeois; all of which were treated successfully by conjunctival transplantation.

He prefers the method of de Wecker, lays stress on securing the subconjunctival tissue, and insists that this adheres only to the injured area. He has found that the conjunctiva should be, if necessary, dissected back as far as the muscular attachments.

As the indication for the operation, he names (1), recent wounds of the cornea either simple, or those which are accompanied with irriducible hernia of the iris (the iris to be first resected); (2), old synechiæ where the iris is on a level with the surface of the cornea; (3), limited corneal or sclero-cornerl staphylomata; (4), corneal ul-

cers that are complicated with hernia of the iris; (5), corneal fistulæ and irido-cyclitis occuring from infection through a cicatrix: and (6), cases of retarded cicatrization following cataract operation.

Surgical Treatment of Exophthalmic Goitre.

PEAN, M. (*Recueil d'Ophthalmologie*, October, 1897.)

Péan, writing under the above title, defends the older method of thyroidectomy, against the more recently suggested operation of extirpation of the cervical sympathetic. He regards the latter operation as being still too slightly known for anyone to speak authoritatively in regard to it. In summarizing his views upon the subject he makes the following assertions, viz:

(1) Basedow's Disease is not always curable by drugs.
 (2) These failing, thyroidectomy should be performed before the system is so exhausted as to compromise its usefulness.

(3) The operation is easy to perform when the goitre is small, not inflamed, not difficult to enucleate and but slightly vascular.

(4) In simple cases a few minutes suffice for the operative procedure. The incision should be median, vertical and small; and by employing the author's form of hemostatic forceps it is unnecessary to tie any vessels.

(5) In cases complicated by friability of the tissues, suppuration (lobar or extra-lobar), numerous areolar cysts which are voluminous, or old resistant adhesions, a single median incision is still sufficient; but, in order to shorten the operation and to avoid loss of blood and injury to the neighboring organs, it is better to clamp the vessels and to remove the tumor bit by bit.

(6) Even in grave cases thyroidectomy is easy of execution and without danger.

(7) Statistics of curable cases are so frequent as to be lost count of.

(8) The myxedema which follows at times is rare and transitory.

(9) That neither exothyropexy nor extirpation of the cervical sympathetic (both of which are easy of performance) have furnished a sufficient number of cases to warrant their being opposed advantageously to thyroidectomy.

Essay on the Ophthalmoplegic Form of Meningitis; Its Early Diagnosis.

DREYER, DUFR M. R. (*Archives d'Ophthalmologie*, November, 1897.)

This author describes the clinical history of the above affection and the result of an autopsy. He lays special stress upon the uni- or bilateral complete or incomplete forms of ophthalmoplegia tending to shift from one of these conditions to the other, as well as to the retinal hyperemia which is marked by great volume but no tortuosity of the retinal veins, (three to four times as large as the corresponding arteries) and a dark color of the venous blood.

These conditions coming in abruptly and particularly in connection with vague head symptoms, should lead the physician to suspect the onset of a meningitis.

On a Chronic Form of Tarso-conjunctivitis with Remarks on Some Allied Condition.

MITVALSKY, M., Prague. (*Annales d'Oculistique*, October, 1897.)

Mitvalsky reports a case of what he considers a hitherto undescribed form of idiopathic chronic tarso-conjunctivitis. He compares and contrasts it carefully, both clinically and histologically with spring catarrh, trachoma, blenorrhagic conjunctivitis, primitive tuberculosis of the tarsal conjunctiva, tarso-conjunctivitis from ectropion, catarrhal tarso-conjunctivitis, catarrhal meibomitis, and syphilitic tarso-conjunctivitis. He concludes that it is an idiopathic form of tarso-conjunctivitis, hitherto unknown, hyperplastic in type, though not necessarily affecting more

than one eyelid. He says that it is characterized by the presence of glandular epithelial tubes which traverse the entire thickness of the tarsal cartilage, to reach the meibomian glands.

The disease, he has found, terminates by atrophy of these glands, with cicatrization of the cartilage and overlying conjunctiva, producing a reticulated cicatrix of a regular design that is limited to the tarsal region.

The clinical picture is that of tarso-conjunctival roughness, differing from hypertrophied papillæ and the excrescences of spring catarrh, but producing the ordinary subjective symptoms. It is curable only by extirpation of the entire tarsus.

Serumtherapy in Plegmonous Conditions of the Lacrymal Sac.

BOUCHERON, Paris. (*Annales d'Oculistique*, December, 1897.)

Boucheron describes most minutely two cases and mentions others in which the serum of Marmorek was employed.

His conclusions are: (a) that in most cases the disease is arrested in from thirty to thirty-six hours; that complete cure requires several days; and that the lesions necessarily continue in their course until the process is arrested; and that this, particularly in cases of traumatic or post-operative suppuration is to be taken into consideration. Consequently he believes that local treatment should also be employed.

(b) That chronic or acute purulent dacryocystitis due to streptococci can be advantageously treated with anti-streptococcic serum, and that the absorption of the mucopurulent exudates of the infiltration material, if recent, can be accomplished by the use of the serum. To obtain a good result from the use of the serum, he thinks that it is essential that the streptococci are sensible to the serum, and that they are either in pure culture or nearly so.

Spasmodic Expulsion of Vitreous in Cataract Operation. A Contribution to the Physiology of the Tensor Oculi Muscle.

NICATI, M. Marseilles. (*Archives d'Ophthalmologie*, December, 1897.)

The author cites two cases of apparently spasmodic expulsions of the vitreous during cataract operations, which he attributes to an irritation of the tensor oculi muscle.

He says that: (1) Such accidents are immediately preceded and accompanied by intense glaucomatous pain with orbital and frontal radiation. (2) They have the manner not of a simple overflow, as is commonly the case, but seem rather to have been driven out of the eyeball.

(3) They follow touching of the iris and traction exercised on the capsule of the lens or, more probably, indirectly through the action of the capsule on the ciliary body.

They may occur either during the operation itself, or during the toilet of the wound. In other words, he ascribes their origin to the "muscular shell of the eye."

Sponge Grafts as a Reinforcing Agent of the Stump After Enucleation.

TROUSSEAU, Paris. (*Annales d'Oculistique*, December, 1897.)

Five cases are cited by Trousseau in which he followed the method of Belt of Washington. In but one instance could he report a perfect result, and, in that one case the artificial eye had been successfully worn. Nevertheless the other conditions were encouraging.

He recommends, the suturing together of the recti muscles in front of the graft as suggested by Belt, and insists that the thread should not be removed before the fifteenth day.

His method of sterilization of the grafts is as follows: The pieces of fine sponge, about a centimeter in diameter each, are first soaked in a solution of permanganate of potassium. This is followed by placing them in bi-sulphite of sodium, after which they are carefully washed with

sterile water. They are then exposed for forty-eight hours to the fumes of formyl and again washed in sterilized water. Finally they are allowed to remain for forty-eight hours' time in a solution of oxycyanide of mercury (20 centigram to the 1000), after which they are enclosed in a sterilized flask ready for use.

✓ **Partial Atrophy of the Optic Nerves Following a Cutaneous Burn Treated by Iodoform.**

TERSON, ALBERT, Paris. (*Archives d'Ophthalmologie*, October, 1897.)

Terson after citing a case of this type compares it with the retinitis and optic neuritis caused by the uremic condition following large surface burns. From his studies he is led to believe that his case, as well as several others recorded by different authors, was a toxic condition caused by iodoform. He believes that these cases may be of any grade, from an amblyopia with a central color-scotoma to a violent inflammation or even an optic atrophy. The macular fibres, he thinks, seem to be those that are first attached.

✓ **Subconjunctival Injections of Permanganate of Potassium in the Cul-de-Sac in the Treatment of Trachoma.**

FERNANDEZ, M. SANTOS, Havana. (*Revue Generale d'Ophthalmologie*, October, 1897.)

Five cases, treated by Fernandez in this manner, gave encouraging results. An injection of a one per cent. solution of cocain is first given, followed, in about twenty minutes, by an injection of from one-half to one gram of a one to one thousand strength solution of permanganate of potassium.

The eyes are washed daily with an antiseptic solution, and in about every eight days (or after the swelling has subsided), the injections are repeated.

Origin and Nature of the Vitreous Body.

TORNATOLA, M. S. (*Revue Generale d'Ophthalmologie*, December 31, 1897.)

Tornatola claims that the vitreous body is composed in part, of fine fibrils (either separate or joined into bundles), of large nucleated mesodermic cells which form and nourish the hyaloid artery, and which disappear with the artery; and in part of smaller bodies, which are either migratory cells or old débris of the larger cells. The fibres can be traced directly to the protoplasm of certain retinal cells, from whence they spring.

The vitreous he believes is, therefore, in accordance with his work, of ectodermic origin, and with the exception of the cells, which are not necessarily parts of the organ itself, not mesodermic, as is generally supposed.

ABSTRACTS FROM CURRENT SPANISH LITERATURE.

BY A. B. HALE,

CHICAGO.

Tenonitis Serosa.—Ocular Tumors.—Carcinoma of the Mediastinum Mistaken for Graves' Diseases.—Phenosalyl in Eye Diseases.—The Physiology of Accommodation.—Muscle Insufficiency.

Tenonitis Serosa.

DR. FRANCISCO PI Y SUNER narrates such a case in detail (*Revista de Ciencias Medicas de Barcelona*, June 10, 1897.) The patient, a married working woman of 49 years, came to his clinic showing the following signs:

There was double exophthalmus, more pronounced on the left side, however; the lids were edematous and of a reddish violet color. The palpebral fissure was narrowed, but could be opened, although there was such extreme chemosis of the conjunctiva that the cornea was nearly hidden. There was no pus, but little lacrymation, while cornea, iris, and the whole fundus were quite normal. The eyeballs, themselves, were quite immobile, so that diplopia was produced.

The history given was that three weeks ago the patient suffered from a gastro-hepatic disturbance, which left her weak, but, being obliged to attend to her work, she had gone out one very cold day at 5 o'clock in the morning. The pain and stiffness she dated from that exposure, the left eye having been first affected.

Pi y Suner made a diagnosis of *tenonitis rheumatica*, by exclusion, there being no evidence of panophthalmitis (both eyes being attacked, moreover), no possibility of

sinus thrombosis, no trauma, and no infective inflammation. The treatment proved the correctness of the rheumatic origin, for with constant hot water applications and good sized doses of salicylate of sodium, all pain disappeared, movement returned, and the swelling subsided. This could not have been due to the conjunctival punctures alone, because the patient herself had tried this, and no result was obtained till the salicylate was given.

Ocular Tumors.

COSTRESANA reports (*El Siglo Medico*, Madrid, No. 2265, May 23, 1897), two tumors, one intra-ocular, one extra-ocular. The first was a sarcoma of the choroid, the symptoms of which, at the beginning, were mistaken for those of acute glaucoma on account of the high tension. An iridectomy was performed, but when no relief was obtained and the diagnosis was properly made, enucleation was promptly done with abatement of all trouble and no metastasis up to date.

The second tumor was a melano-sarcoma at the conjunctival limbus. Its removal left the eye comparatively undamaged.

Carcinoma of the Mediastinum Mistaken for Graves' Disease.

Such a case is narrated in detail by GUSTAVO LOPEZ (*Cronica Medico-Quirurgica*, No. 12, June, 1897). During life, from the beginning of the symptoms, the diagnosis of thyroid involvement was apparently unavoidable. The classic tripod of enlarged thyroid, tachycardia and exophthalmus was easily demonstrable, but no improvement followed treatment, and the patient died at last of exhaustion. On post-mortem examination the nature of the case was explainable by a mediastinal tumor (carcinoma), which had in growing pressed against the blood-vessels so as to produce venous congestion, and had approached the sympathetic enough to irritate it.

Phenosalyl in Eye Diseases.

This drug is highly recommended by SANTOS FERNANDEZ of Cuba (*Gazeta Medica de Mexico*, Jan. 15, 1897). Phenosalyl is a mixture of nine parts carbolic acid, one part salicylic acid, two parts lactic acid, and one-tenth ($\frac{1}{10}$) part menthol, prepared by heat. He uses it in all kinds of eye diseases as an antiseptic, or as a preservative of medicinal applications. In vaselin it can be used as strong as 10 per cent., or in weaker percentage when an alkaloid is added. As a preservative he advises one part to one thousand distilled water; as a collyrium it is serviceable up to a one per cent. solution.

The Physiology of Accommodation.

BANDERA (*Gazeta Medica de Mexico*, January 15, 1897), calls attention to the fact that in 1871, Carmona y Valle, at that time professor of physiology, presented to the Academy of Mexico a theory of accommodation differing from that of Helmholtz. He showed wherein Helmholtz's theory was defective, and added data based on observation and reasoning which explained more logically the action of the ciliary muscle and lens. Since that time Tscherning's theory, promulgated comparatively recently, has been recognized by European physiologists, and has its supporters, who likewise deny the validity of Helmholtz's. This theory of Tscherning is somewhat like Carmona, yet not so good. [I have omitted the technical steps of the proof because an abstract would not do it justice, and a translation would be too long for the ANNALS. This notice is inserted here to draw attention to this claim of a Spanish-American, because it seems unfortunate that the Western Hemisphere finds it so hard to acquire due recognition among European scientists. If Carmona's claim to priority is correct, it ought to be recognized, and anyone interested in this claim, or in the article itself, can, I am sure, get the complete essay by writing to the Academia de Medicina, Mexico.—A. B. H.]

Muscle Insufficiency.

LORENZO CHAVEZ (*Gazeta Medica de Mexico*, June 1, 1897), reviews the subject of tenotomy for squint, as well as for heterophoria, and concludes that advancement—as advocated by Landolt, of Paris,— is better than simple tenotomy in all cases. He reports several cases operated on by him, among them being instances of heterophoria occurring in Mexican women who could not be accused of hysteria, all of whom got well after advancement, while other treatment had left them unimproved.

ABSTRACTS FROM CURRENT GERMAN AND ENGLISH NEUROLOGIC LITERATURE.

BY WENDELL REBER, M.D.

PHILADELPHIA, PA.

A Point in the Diagnosis of Third Nerve Lesions.

In the *Journal of Nervous and Mental Diseases* for December, 1897, Dr. C. A. Wishart presents the following problem:

A strong healthy 30-year-old white woman developed ptosis one week after a profound attack of vertigo. She had always been in good health, had never had a miscarriage, and positively denied specific taint. Examination revealed paralysis of the inferior oblique only on the right side, and of all the muscles supplied by the third nerve save the inferior oblique on the left side. The candle test showed crossed diplopia, with the left image higher but erect, while the upper extremity of the right image was inclined to the right. There was secondary deviation of the right eye.

In addressing himself to the solution of this problem, Dr. Wishart introduces Parlia's schematic diagram of the nuclei of the third nerve, (see Knies' *Die Beziehungen des Sehorgans und seiner Erkrankungen zu den übrigen Krankheiten des Körpers*, p. 21, 1893), which pictures the inferior oblique fibres of the right third nerve crossing to the nucleus of the left third nerve. Wishart goes on to state that the description usually given of classic third nerve paralysis is applicable only to cases of total third nerve palsy due to lesion outside of the nucleus. Arguing from Knies' diagram, he affirms that a unilateral lesion affecting the whole of the left third nerve nucleus must result in the particular form of palsy described in the above

case, namely paralysis of all the muscles supplied by the left third nerve save the inferior oblique, and paralysis of the right inferior oblique only, on the right side.

Dr. Starr states in his work that "if all the muscles of the eyeball supplied by the third nerve are affected, including the iris, the case is one of total peripheral paralysis of the third nerve and the lesion lies at the base of the brain." To this Dr. Wishart would add, "but if all the muscles of one eye supplied by the third nerve are affected except the inferior oblique, with paralysis of the inferior oblique alone of the opposite side, the case is one of total unilateral nuclear paralysis of the third nerve and the lesion lies on the same side as the more paralytic eye.

[This is quite a nice point in the exact diagnosis of third nerve problems.—W. R.]

The Psychology of the Vision of Children.

In the *Psychologic Review* for October, 1897, Cathleen Carter Moore narrates the chronologic awakening of the complexity of functions that finally blend in form and color vision and perspective. Her observations conducted on her own child are briefly as follows:

First day—The child opened its eyes only by a narrow crack; the eyeballs roll about in every conceivable position; pupils hardly affected by strong light.

Second day—Looked intently at a bright object and followed its movements.

Third day—Eyes wide open but not co-ordinated.

Eighth day—Eyes seem to be co-ordinated for the first time.

Tenth day—Eyes often co-ordinate, even in the more complex movements.

Forty-seventh day—Observes things with interest.

Sixtieth day—Looked at strange faces seriously, but smiled at familiar ones.

Twelfth week—Would remain quiet an hour watching trees sway in the wind.

Fiftieth week—Made grimaces at his own reflection in the

mirror, and ceased when he saw by reflection that he was being observed.

Fifty-eighth week—Recognized a person he had seen for a few minutes three days before, but by whom he had been hurt.

One-hundredth week—Showed no preference for colored pictures over uncolored ones.

[This last finding is not supported by the investigations of Prof. Baldwin, of Princeton, who studied the dawning of the color sense in his own child in the early part of its ninth month of life. He employed bits of colored blotting paper, placed one at a time at different distances from the child. Account was kept of the number of times the child reached out toward each. Blue, red, white, green and brown were used, with bits of newspaper as a relatively neutral object. The tables growing out of his particular study show that for his child, at least, there was a well established color preference manifested as early as the ninth month, and that the colors arranged themselves in the following order: Blue, white, red, green and brown, (taken from Prof. Baldwin's "Mental Development in the Child and Race Methods and Processes," 2nd edition, p. 52.)—W. R.]

Paradoxical Pupillary Reaction.

In the *Journal of Nervous and Mental Diseases* for August, 1897, Dr. J. E. Mitchell reviews an article from the pen of Dr. H. Fraenkel published originally under the above title in the *Gazette Hebdomadaire Medicine*, for August, 1897. The phenomenon occurred in a man who was the subject of an alternating divergent squint. The backgrounds of both eyes were normal. The right visual field was slightly contracted with normal succession of color. The left field showed marked contraction, amounting, indeed, to left nasal hemianopsia. O. S. also the seat of paresis of the internal rectus and the levator palpebræ, and presented a smaller pupil than on the right

side when the eyes were at rest. Both pupils reacted normally to accommodation, but when the light was thrown on the left eye its pupil remained motionless for five or ten seconds, then dilated slowly to double, or more than double its previous diameter, remaining dilated until the light was withdrawn, when it would rapidly contract again. The same phenomenon was less pronounced on the right side. As the patient was found to have an aortic insufficiency with enlargement of the heart, it might readily have been concluded that the cause of the paradoxical reaction lay in the encephalon, being due to localized hemorrhage or other results of ocular disorder; but Dr. Fraenkel drew a different conclusion. Closer observation showed that when the patient surveyed a distant object, the right eye deviated and the left eye fixed; hence the left pupil would remain contracted for a moment, and then as the right eye rolled out temporal-wards, the left pupil dilated, thus giving the supposed contrary reaction. A contrary test showed that the pupils were unchanged during accommodation as long as both eyes remained stationary, but when the interni became fatigued, *and not till then*, did dilatation of the pupil begin.

Dr. Fraenkel states frankly that he does not believe that this reaction is in any way an abnormality; that the dominant condition which makes it possible to observe a pupillary dilatation during lighting, *but not in consequence of it*, is the presence of the Argyl-Robertson symptom, although there has been one case of paradoxical reaction recorded in a hysteric in whom the Argyl-Robertson symptom was wanting.

[The foregoing case does not seem to me to be a clear case of contrary reaction, because of the complicating influence of the paresis of the rectus internus and the elevator of the lid, also the nasal hemianopsia all occurring on the left side and indicating some central mischief, either basal or subcortical. I have recently had under observation a young woman also the subject of alternating divergent squint, who can by an effort of the will converge perfectly for 12 to 14 inches, not very long, however.

During the convergence the pupils measure 2 mm., but the interni soon tire, and when one eye rolls off toward the temple immediately the pupil of the other expands to $4\frac{1}{2}$ to 5 mm. And although I have never experimented for contrary pupillary reaction in the dark room with this patient, I am constrained to believe that contrary or paradoxical pupillary reaction can be diagnosed with absolute certainty only when the optic axes are parallel or convergent; that there must always remain a doubtful element when there is associated with this phenomenon an alternating divergent squint. W. R.]

Peculiar Visual Anomaly Following Blepharospasmus.

In the *Archiv fur Psychiatrie und Neurologie*, Part 1, 1898, P. Silex treats of a condition that no doubt has confronted and baffled many an ophthalmic worker. He defines rather than classifies the disease which he terms "Peculiar disturbance of vision following blepharospasmus." The malady is most frequently met with in children two to four years of age, usually of the scrofulous habit. By reason of this taint they commonly exhibit phlyctenular keratitis, which soon induces reflex blepharospasm. Silex condemns all irritative or stimulating measures in the treatment of this disease, affirming that the subsequent amaurosis that occurs in many instances demands the use of such measures as will dispel the spasm of the lids and permit the eyes to accustom themselves at the earliest possible moment to their environment. If this be not done chronic blepharospasm becomes a habit, and it may be months before the eyes are exposed to ordinary daylight. Then suddenly some day the child voluntarily or involuntarily opens its eyes when the parents, and subsequently the oculist, find that the child is virtually blind. This amaurotic period varies in duration from a few days to two or more months. The following history, taken from a number submitted, is fairly illustrative of the type:

After bilateral keratitis of fourteen weeks' duration, a bright 3-year-old child opened its eyes, but presented the

appearance of complete blindness, notwithstanding that the globes and fundi seemed normal and the cornea perfectly clear. By means of the senses of hearing and touch the child could give correct evidence about everything brought within its reach as quickly as any ordinary child of its age. The return of vision was exceedingly slow. On the seventeenth day large objects began to be recognized, and on the twentieth day the child would avoid large objects placed in its path. On the twenty-second day it recognized a candle flame and followed it with its eyes. On the twenty-ninth day the child could not name small familiar objects, such as it had played with for days together, but the moment the fingers were brought in contact with them he named them correctly. By the thirty-eighth day small objects began to be well discerned and designated, although the central visual acuity was even then affected. On the fifty-third day the child astonished its family by its knowledge of persons and things it had known nothing of during its illness, and on the eighty-third day the child was normal in all of its visual functions.

Silex, in speculating on the intimate nature of the disorder, rejects the idea of its origin in the eye, the optic nerve or tract, and is convinced that the visual disturbance is entirely central in origin. He then takes up seriatim, the following possibilities: (1) Reflex amblyopia; (2) hysteria; (3) losing of the visual faculty; (4) soul-blindness; and, (5) cortical blindness, and, in turn, discards every one, frankly confessing, in conclusion, that, in the present state of our knowledge it is impossible, from the etiologic standpoint, to label the disorder.

CORRESPONDENCE.

ANOTHER CASE OF KELOID OF THE CORNEA.

Editors of the Annals of Ophthalmology:

Almost simultaneously with the arrival of the July number of the ANNALS, a case was brought to me which was to all external appearances identical with the one described therein by Dr. Cassius D. Wescott, of Chicago, as "Keloid of the Cornea."

The baby, Leoni W., was 1 year old. There was a history of ophthalmia neonatorum with profuse discharge, which had run its entire course without treatment. The site of the left cornea was occupied by what I at first sight took for total staphyloma with epidermization. The child was asleep at the time of examination, and on raising the lid I was at once struck with the appearance of density which characterized the protrusion. This was due to its color and shape. The former closely resembled that of the pinkish ground-glass beads made to imitate pearl. The tint was faint and due to numerous minute capillaries. The surface was perfectly smooth, but with the dull finish of ground glass. The smoothness amounted almost to a sheen. The shape was much like the thick hood of a mushroom. It rose so abruptly from the thinned and bluish sclero-corneal junction that the broad summit slightly over-topped the somewhat constricted base. Upon touching its surface with the finger it was found to be devoid of sensibility. It could be freely manipulated without waking the child. Palpation at once showed it to be a tumor of marked density and thickness. The mother reported that it had begun to develop some months after the eye had ceased to discharge, and was apparently well. It had gone steadily on until it had reached its present proportions. The tumor was about 3 mm. in height.

The right eye was in a most interesting condition, viewed in connection with the history of the left. The same process was apparently taking place there. It had, however, started much later, and was still in a comparatively early stage. There was an eccentric conical protrusion occupying about one-half of the cornea. This eye was not so extensively involved in the original inflammation as was the left. The general appearance of this smaller tumor, was identi-

cal with that of the larger one, except in shape and size. It was shaped like a Turkish fez, and was about one-third the size of the other.

Six weeks later I saw the case again. There had been no change in the larger tumor. The change in the smaller, however, was interesting. Instead of presenting a sugar-loaf shape, the summit was more rounded and the sides already extended beyond the base. It would seem reasonable to assume that the cicatricial hyperplasia, having originally taken place chiefly over the site of the perforation or deepest ulceration, after rising above the corneal surface extended also laterally, giving to the tumor eventually a more or less pedunculated character.

Los Angeles, Cal.

FRANCIS B. KELLOGG.

BOOK NOTICES.

A New Classification of the Motor Anomalies of the Eye.

DUANE, ALEXANDER, M. D., Assistant Surgeon Ophthalmic and Aural Institute. New York. The prize essay of the Alumni Association of the College of Physicians and Surgeons, New York, for 1896. J. H. Vale & Co., New York.

The conscientious reviewer of this book, familiar though he may be with recent literature on the subject of the physiologic and pathologic muscular conditions, and particularly with Stevens' numerous and valuable contributions, gladly acknowledges his indebtedness to Duane for his very clear elucidation of the partly understood laws governing muscular movements and co-ordination, and for his tables and summaries which comprise the practical applications of the laws. He admires and envies the perseverance and thoroughness of the study, evident on every page of the book, the deliberate, honest and independent judgments and the earnest desire that only the whole ungarbled truth shall be taught. The honor of having been awarded the prize, we venture to say, is the least of the rewards accruing to the author from the publication of this little book. It comprises within 100 pages a collection of facts deduced from many analyses of muscular conditions both in health and disease, woven into justifiable conclusions that can not fail to be the greatest aid in the recognition of pathologic states. We have no hesitation in using the phrase, hackneyed from misuse, that this book fills a long felt want. The reviewer has, more than once, expressed the hope that a capable pen, guided by an analytic mind, would compress the undisputed data of "muscle-ology" into one volume that could be understandingly read and re-read, and again referred to. We predict that in its present form the material, already published as a serial in the ANNALS OF OPHTHALMOLOGY, will have a wide circle of readers and absorbers.

Duane offers a problem for solution, namely, "Given a case with a certain train of symptoms, to determine the ultimate cause of these symptoms, *i. e.*, the part or function that is primarily deranged and the manner of its derangement," and answers it by considering the different normal functions, their anatomic seat, possible disturbances, the method of diagnosis of the presence and nature of a derangement of any special function and the conditions actually met with in practice. He discusses the action of individual

muscles, their capabilities of rotation and the associated movements of the two eyes in such terms that the thoughtful reader can readily master the physiologic principles underlying the explanations of the symptoms of pathologic conditions, which he considers later.

The diagnosis of muscular anomalies is made by inspection, by the fixation and diplopia tests, the equilibrium, screen and parallax tests and the determination of the strengths of the muscles in convergence (wrongly called adduction), divergence (wrongly called abduction) and sursumvergence. In his new classification, Duane aims to express both the symptom and the condition and criticises Stevens' nomenclature, because his terms lack the latter significance. Thus, Duane suggests the words "Hypokinesis," meaning that a rotation inward, outward, upward, or in any other direction, is performed inadequately or not at all; "Hyperkinesis" that the movement is performed excessively; "Parakinesis" that it is performed irregularly, in successive phases of excess and inadequacy. We are loth to discard the "phorias" and "tropias" for terms that seem to us to have no better claim to recognition than the "kineses" for we do not concede that the double meaning is advantageous. On the other hand, Stevens' terms are superior in that they express unequivocally the symptom present, namely, a tendency to deviate or an actual deviation, without misleading the student by directing his attention to remote causes that can only be elucidated by patient investigation, and not always then. The nomenclature, however, is a minor point. The most admirable feature about the new classification is the scientific accuracy of the details given for the investigations of morbid muscular conditions and their practical application in every day experience. For example, on page 91, he gives the following summary of deviations (one paragraph will suffice to show the method pursued in all):

Inward Deviations—(Esophoria, convergent strabismus) may be due to:

(a) Over-action of one or both internal recti or of the other abductors of the eye (superior and inferior recti).

(b) Under-action of the external rectus or of the other abductors (the obliques).

(c) Under-action of the center for producing divergence movements (divergence insufficiency).

(d) Over-action of the center for producing convergence movements (convergence excess, which, in turn, may or may not be due to excessive accommodative action).

(e) Two or more of the above causes combined.

The title, "New Classification, etc.," unfortunately does not adequately express the scope of the contents, nor give a hint of the presence of the most valuable chapters in the work. HANSELL.

Partial Stationary Cataract.

WINTERSTEINER, HUGO. 1. Assistent an der I. Universitäts-Augenklinik in Wien. (*Die partiellen, stationären Staare.*) Augenärztliche Unterrichtstafeln. Für den akademischen und Selbst-Unterricht. Herausgegeben von Prof. Dr. H. Magnus. Heft XI. J. U. Kern, Breslau. Price 17 marks, (about \$4.25.)

This number of the ophthalmic plates for lecture purposes is more elaborate than those preceding. There are 20 plates of two figures each, making 40 artistically colored pictures drawn from nature, enlarged 5 diameters. The appearances are depicted as shown by direct illumination with the plane ophthalmoscopic mirror of Magnus behind which a strong convex lens is used, and by oblique illumination as shown by Hartnack's lenses. This is accompanied by 32 pages of description upon the morphology, topography and etiology of partial stationary cataract, together with case histories which are largely taken from patients observed by the author in the university clinics of Stellwag v. Carion and J. Schnabel, in Vienna, in which minute descriptions of the lenticular changes are given. These are described under the following headings:

A. Lenticular cataract.

a. Axial cataract, in which is included cataracta corticalis polaris anterior et stellata, corticalis punctata, perinuclearis, centralis sive nuclearis congenita, corticalis polaris posterior et stellata, fusiformis.

b. Asymmetrical cataract, including cataracta corticalis anterior, posterior and equatorialis.

B. Capsular cataract.

a. Cataracta capsularis polaris anterior et cataracta pyramidalis.

b. Secondary cataract, (after extraction of the nucleus.)

In this number the publisher states that these ophthalmic lecture charts have met with favorable reception both at home and in foreign countries, and have been brought into international use. They propose shortly to republish each number in French and English, as well as in German. Ophthalmic teachers will find these charts and the accompanying text very advantageous for lecture purposes, and there is no doubt that by following them closely the quality of the average school lecture may be greatly improved. They are likewise of value to the practicing ophthalmist.

H. V. W.

The Development of the Eye.

FICK, A. EUGEN, Privatdocent an der Hochschule Zürich. (*Die Entwicklung des Auges.*) Augenärztliche Unterrichtstafeln für den akademischen und Selbst-Unterricht. Herausgegeben von Prof. Dr. H. Magnus. Heft XIII. J. U. Kern, Breslau, 1897. Price 10 marks, (about \$2.50.)

A series of 9 plates with 22 pages of accompanying text giving the general development of the eye, the lens, vitreous body, retina, optic nerve, uvea, cornea, sclera and ocular appendages in a manner which will prove of great assistance to the lecturer. The plates are diagrammatic in nature, but are well drawn and colored.

H. V. W.

Kroll's Stereoscopic Plates for Squint.

PERLIA, R., Crefeld. (*Kroll's Stereoskopische Bilder für Schielende.*)

Twenty-eight colored illustrations. Leopold Voss, Hamburg, 1897.

Also published by B. Kahn & Son, New York, and described by C. F. Prentice in "Keystone," December, 1897.

It is claimed that the muscles of the eyes are capable of being strengthened by these orthoptic exercises, upon the same general principle that athletes strengthen their muscles through gymnastic training. These pictures differ from the regular stereoscopic views, in that, each half of their ordinarily congruent halves presents an entirely different picture, or a materially modified one of the other half. For perfect parallelism of the visual axes, together with relaxed accommodation, and which are conjointly essential to perfect binocular vision, when properly proportioned views are seen through a scientifically constructed stereoscope, it is necessary that congruent parts of each half of the ordinary stereoscopic pictures should exactly cover each other. Kroll's pictures are so devised that their differing halves, when viewed through the stereoscope, shall appear to cover each other, or be in such proximity to each other as to produce a single picture, whose component elements of design shall consistently compose the whole. Thus, for instance, a picture consisting of two halves, one of which presents a mouse and the other a trap, should, when seen through the stereoscope, present to the eye of the observer, whose visual axes are naturally parallel in orthophoria, an image of the mouse centrally located within the trap. Should the mouse fail to reach the trap, it will indicate excessive convergence, the images being homonymous; or, in the event of the mouse passing beyond the trap, the images being crossed, it will indicate insufficiency of the internal muscles.

The two optical principles involved in the stereoscope are:

First—The application of the magnifying power of two lenses to increase the size of the picture viewed, and which will be greatest when the picture is placed at the focal distance of the lenses, from whence rays entering the eyes are parallel and consequently, adapted to the condition of emmetropia. For this fixed position of the picture, it is therefore imperative that the eyes should be emmetropic, or at least rendered so by the observer's distance glasses.

Second—The application of a pair of prisms combined with the lenses, with their bases out, and of such power as to produce per-

fect fusion of the images of both halves of the stereoscopic pictures viewed.

This is the fourth edition of Kroll's plates. They are used as soon as a child begins to show imbalance of the eyes in a stereoscope, first with Figs. 1 to 14, (unlike pictures, bird and cage, mouse and trap, etc.), until the squinting eye recognizes the positions in which they should be seen. Then the like pictures are used for fusion purposes. By external squint the pictures are further apart, and for internal, brought together. He claims that eyes can be prevented from becoming amblyopic from disuse and that the method is useful in acquiring parallelism of the visual axes after operative procedures. The plates are valuable for detection of simulated binocular blindness.

H. V. W.

Ophthalmological Therapeutics.

LANDOLT, E., Paris, and GYGAX, P., Milwaukee. (*Therapeutisches Taschenbuch für Augenärzte.*) Translated from the French into German by H. Landolt, of Strassburg; printed by J. F. Bergmann, of Wiesbaden, 1897. Price 2 marks. Also the same translated into English by E. Neyman, of Milwaukee; printed by J. B. Lippincott Co., Philadelphia, 1898.

It is with pleasure that the editor wishes to commend these editions of Landolt's and Gygax' little work, which really fills an unique and desirable position in ophthalmic literature. The personality of Landolt is seen through all its pages, more particularly in his advocacy of partial correction of hyperopia and myopia. He remarks that patients hardly ever tolerate permanently the glass correcting the myopia, and it is nearly always better for a myope to use no concave glasses for near vision. With this we do not all agree. As would be supposed, tenotomy in squint or "insufficiency of convergence" is condemned and advancement advised. The terms of heterophoria, etc., are not used. No mention is made of hyperphoria and esophoria, two conditions which are certainly very common, and which no ophthalmic surgeon can afford to overlook. The work is not a treatise of ophthalmic therapy, or a dictionary, but is a small, easily portable guide. The headings are arranged in alphabetical order, and the text replete with the remedies and formulas found by the authors to be efficacious for the various diseases of the eye. So-called modern forms of treatment, the therapeutic value of which is not yet established, are purposely omitted. Operations are mentioned but not described.

It will be found of practical advantage to any practitioner of medicine, but more especially to the practicing ophthalmic surgeon.

H. V. W.

Microphthalmus, Coloboma and Hemimicrosoma.

RAEALMANN, E., (*Ueber Microphthalmus, Coloboma oculi und Hemimicrosoma*. Bibliotheca Medica. Abtheilung C. Pathologie und Pathologische Anatomie. Erwin Nägele, Stuttgart, 1897.)

The literature of microphthalmus is connected with that of other congenital anomalies of the eye, especially coloboma of the iris and the choroid. It is likewise closely bound to a large number of defects of development of the body. In this number of the Bibliotheca Medica the literature is freely quoted and two case histories given. In a 45-year-old woman with microcephalus there was likewise microphthalmus and microcornea. The eyes were myopic, the right 18 and the left 15 D.; the visual fields were contracted. Coloboma of the iris and choroid also existed. In the other case, a 16-year-old girl, there was a complete hemiembryonal stoppage of development upon the left side with consequent partial development of the eye. The following clinical and anatomical changes and symptoms are usually observed in microphthalmus: Destruction or weakness of the intellect; nervous diseases, such as chorea, nystagmus; congenital defects of the head, especially microphthalmus; congenital defects of the eye, varying from anophthalmus to choroidal and iris coloboma; imperfect development of the entire body or of one side; atrophy of an entire half of the body, especially of the face; dwarfing of an entire half. He considers these changes teratologic and to be due to imperfect half development in the embryo. This division of the Bibliotheca Medica has 21 quarto pages, and is illustrated by two large plates.

H. V. W.

NETTLESHIP, EDWARD, F. R. C. S., Ophthalmic Surgeon at St. Thomas' Hospital, London; Surgeon to the Royal London (Moorfields) Ophthalmic Hospital. Revised and edited by W. T. Holmes Spicer, M. A., M. B., F. R. C. S., Ophthalmic Surgeon to the Metropolitan Hospital and to the Victoria Hospital for Children. Fifth American from the sixth English edition. With a supplement on Color Blindness by William Thompson, M. D., Emeritus Professor of Ophthalmology in the Jefferson Medical College of Philadelphia. 12mo. of 521 pages, with 2 colored plates and 161 engravings. Cloth, \$2.25. Lea Brothers & Co., Publishers, Philadelphia and New York. 1897.

I have recently had on my table for study two books presenting quite distinct paths on which the student may approach the fascinating, but difficult study of ophthalmology. The one is a veteran of twenty years which has settled into a maturity of the sixth edition and now, in new type still holds itself ready to teach the children of its earlier friends. The other is the first born product of a foreign school, fresh in its endeavor to add one more short cut to the practical fields of applied knowledge. In following these two accidental

companions, I have been struck by the unfairness of my own bias toward the foreign school by my ignorant assumption that the "mode in Germany" was the only bulwark par excellence and trustworthiness, and I am, therefore, the more ready to review the two side by side, so that, while not ceasing to respect and honor the new, I may do a belated justice and give my full and warranted praise to the old.

I wish I might say that this is an old friend, but I am sure that from now on I shall make it so. The book is not perfect, as no book ever will be, but in the few weeks spent in making its acquaintance, I have learned that many things are best expressed in the native English way. The whole effort of the book is to give the student practical advice as to diagnosis and treatment, with only enough dogmatism and pathology thrown in to make it readable. Systematic it is not, if by system is meant that complete classification in which each disease is tabled and labeled for filing purposes; but the reader who has a case (and after all medical life is made up largely of cases and not of specimens), will be but rarely at a loss for its description and treatment in Nettleship. There is also no strong assertion as to the fallacy of earlier men, or the superiority of modern method. It is just a text book, from which, in its present sixth edition, all the superfluous has been weeded out, much of the phraseology simplified, and every effort made to please the student. Not that everything pleases me—I do not like for instance, the meagerness of the description of the "External Examination of the Eye," nor the random and weak use of abbreviations, such as p., p. l., y. s., etc.; nor the disturbing "two grain solution" (whatever that is), but I do acknowledge that the chapter on cataract is one of the finest I ever read. While for directness, clearness and brevity, the pages on Glaucoma are a delight.

It is a pity that the old English weights and measures are not yet displaced (in an American edition at least), by the more sensible metric system; it is surprising that the old and dirty seton is still recommended for iritis and keratitis, instead of the cleaner artificial (or natural) leech, but as I never tried a seton I have no right to criticize; it is unfortunate that membranous and diphtheritic conjunctivitis are considered as one, with no effort made to establish a sharp contrast between the malignant and benignant forms of the clinical condition; it seems to me wrong to place the lacrimal gland in diseases of the orbit instead of in those of the lacrimal apparatus; I am certain it is an error to say (p. 140) that "during the last few years eserine has come into use for certain cases (of corneal ulcer) which would formerly have been treated by atropine," because I remember seeing in an old book of Brudenel Carter's that eserine is the thing for corneal ulcers. It is unfortunate that the treatment of interstitial keratitis (p. 145) by iodide of potassium is dismissed by saying that with the necessary course of mercury "it

probably has some influence," because this violates modern therapeutics and bases treatment upon a false pathology; it were better to have omitted all foot-note references than to allow such slovenly citations as "paper by S. Mackenzie, Trans. Oph. Soc.," to creep in (p. 251): it is careless not to distinguish between hemianopia, hemiopia, and hemianopsia—but all these are mere trifling defects left by the editor in his armor, through which our shafts of criticism may glide (and who does not like to criticise?); my opinion is still unchanged, the new Nettleship is now an old friend, and I hope many a student will meet no worse one. Chapter XXII, "Operations," is remarkably complete, and shows the practical side of the Englishman in every detail. Part III, Chapter XXIII, "Diseases of the Eye in Relation to general Diseases," is short but explicit; while the supplement by Dr. William Thompson, of Philadelphia, on Examination of Railway Employes as to Color-blindness, Acuteness of Vision and Hearing, is a credit to any book, and will fully meet the students wants for many a day to come.

Retinoscopy and Heterophoria. The shadow test for both concave and plane mirrors is given simply enough, but its utility over the direct use of the ophthalmoscope and of the trial lenses is disputed; the student can take his choice. Heterophoria is bracketed in a page, which means that the student is not let into a discussion of the economical side of our art. It is a good book. A. B. H.

Grundriss der Augenheilkunde.

VON DR. FRIEDRICH HOSCH, A. O. Professor an der Universität zu Basel. Mit 82 Holzschnitten. Wien und Leipzig. Urban & Schwarzenberg, 1897; 12mo., 504 pp.

I have always liked German books for their systematic discussion of a subject, their habit of beginning at the beginning and ending at the end, carries the conviction that the author is a master of his science and art, and in furnishing a ground-plan for the student, is but attempting to say in his own words what others have already said in theirs, filling in details with the results of his own experience. Such, certainly, is this book of Hosch, as the author's well known name would guarantee, but the reader and student cannot go amiss in selecting it as a text book of ophthalmology from the German point of view. Moreover, the letter press and paper are exceptionally good, while the illustrations (no colors) are good enough to convey the meaning. The only original chapter is the tenth, wherein Hosch emphasizes his and Ramon y Cajal's (*not* R. y Cajal's) latest investigations in the histology of the retina.

I have enjoyed reading the book, and have been benefited by it, but I cannot think that it will displace any of the large or small handbooks which Germany has given us in such great abundance

within the last ten years. The addendum of errors (p. 504) releases me from the necessity of noting them, but I must criticise the exaggerated partiality the author shows for that dreadful German habit of abbreviation. I hate it, and shall never think a book artistic which tolerates such expressions as *neu.* for *neuritis*, *m. a. W.*, for *mit anderen Wörtern*, *u. dergl. und dergleichen*, freely used in the text. I am glad to see Graefe's latent squint test supplemented by the modern experiment with Maddox' rod, but of course heterophoria as such is not noticed. Skiascopy is taught, but chiefly with the concave mirror. The author is overbold in advancing the use of scopolamin in a 1 to 2 per cent. solution, for such a strength is unnecessary, and even dangerous.

The chapter on the relation of diseases of the nose and of the sinuses to the eye is particularly praiseworthy, because it sets the student to thinking; and the separation of all operations into a chapter by themselves, is well done, and a practice that seems to me commendable in every way.

A. B. H.

Practical Handbook of the Diseases of the Eye.

WATSON, D. CHALMERS, M. B., C. M. (Ophthalmic surgeon Marshall Street Dispensary, Edinburgh, etc. The MacMillan Company, 1897.)

This work can hardly lay claim to any practical value as a handbook or clinical "*vade nuncum*" for medical students, and certainly deserves no place in the library of a practitioner or specialist, except, perhaps, as a curiosity—showing what a young man may be led into by the exuberance of his enthusiasm.

The book is devoid of any value to the student, from the fact of its being nothing more than a syllabus, giving a bare, and, in many cases, incomplete outline of the subjects treated. There are numerous technical mistatements, as for example:

"Symptoms of asthenopia are due to weakness in the power of accommodation." "Photophobia may be due to diseased conditions of the surface of the eye, as in iritis." "Lacrymation is excess of secretion due to some *obstruction* in the lachrymal apparatus." "Blepharitis is *always* an indication that the general health is low."

Many other dubious statements, too numerous to mention, have been allowed to appear through carelessness, or lack of knowledge. The author's usual advice, under the head of therapeutics, is the hackneyed "direct the treatment to the cause." Where the mode and method of treatment is specified it is in many cases at variance with

that commonly employed. To cap the climax, he has seen fit to modify the plates from Jaeger's atlas, the result being a set of colored diagrams, poorly representing the fundus appearances.

Admitting that there may be occasions for the use of a compend, one must say that this is an example of what a compend should not be.

CROCKER.

NOTES AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest to its readers. Please address Albert B. Hale, M. D., Columbus Memorial Building, 103 State street, Chicago.)

Prof. B. Berlin, Professor of Ophthalmology at the University of Rostock, is dead.

Faravelli, privatdocent in Ophthalmology at Pavia, died last July, at the age of 36.

Dr. A. G. Aldrich of Anoka, Minn., is spending a few months in Europe in the interest of ophthalmology and otology.

Vienna gives us the news that one of its professors has discovered the specific diplococcus of Egyptian ophthalmia—trachoma.

Dr. C. B. Meding, of New York, has been elected executive surgeon of the Harlem Eye, Ear, Nose and Throat Infirmary.

The "Deutsche Ophthalmologische Gesellschaft" has divided this year's Graefe prize between Privatdocent Axenfeld (Breslau) and E. v. Hippel, (Heidelberg).

Dr. H. L. Hale and Dr. J. A. Cramp have been appointed assistant surgeons to Wills' Eye Hospital, in Philadelphia, to serve respectively in the clinics of Drs. Frank Fisher and J. W. Croskey.

The Russian Society of Ophthalmology has been recently formed and from it we are promised more systematic reports of the studies in eye diseases than we have hitherto obtained from Russian experience.

It is stated the Quebec College of Physicians and Surgeons has issued a decree prohibiting medical men from accepting positions as physicians to charitable or benefit societies, under pain of withdrawal of the privilege to practice.

Herr O. Lummer is of the opinion that the "gray glow" noticeable before a heated body begins to show the "red glow" indicates a different susceptibility of retinal rods and cones to light of varying intensity, the "gray glow" being perceptible to rods only.

It is reported on good authority (I have not seen the official act, so cannot quote it) that hereafter all foreign students attending German universities must pass an examination equivalent to that required of native students of the same grade before they will be admitted to participation in the various courses and laboratories.

The publishing house of J. B. Bailliere, et Fils, 19 Rue Haute-feuille, Paris, has just issued a *Bibliographia Ophtalmologica* (8°, 32 pp. 2 columns) containing the date of publication, number of pages and an extract from the index, of 2,000 ancient and modern books on the eye. This volume will be sent free to any one applying for it.

In the "*Zeitschrift für Biologie*" (Neue Folge 16 Band) en Jubelband zu Ehren von W. Kühne, are several articles of special value to ophthalmological physiology. Knies publishes an essay on the course of the centripetal optic nerve bundles; Hanan one on the cause of paralytic keratitis, and Pfitzner one on the epithelium of the conjunctiva.

Dr. Arthur Y. Bennett, of Erie county, recently read a paper before the New York State Medical Society, upon Massage as an Occupation for the Blind, in which he called attention to the large and increasing number of blind persons, most of whom are dependent upon others for their support, and said that the estimated number in this country is 56,000, of which 4,398 are in this state. In order that many of these may become self-supporting, he advocates that these be taught massage in the state institutions, being trained in the anatomy and physiology of the body before they learn the practical work. He considers that the peculiar delicacy of touch which the blind possess, makes them especially fit for this kind of work.

The first number of the *Wochenschrift für Therapie und Hygiene des Auges* (editor Dr. Wolffberg, Breslau, Freiburgerstrasse 9) has duly arrived, and its make-up is very taking. The *piece de resistance* is an interesting article by Dr. Hermann Cohn (Breslau) on vision-testing of school children, soldiers, and the uneducated in general, by his improved charts, the use of which insures rapid and accurate work even in the hands of persons inexpert in ophthalmology.

logical methods. Other sections are devoted to extracts of technical interest, to personal notes, and to statistical problems. It is a weekly review worth having, and its price, 1.50 marks a quarter (internal postage) is certainly reasonable.

The ancient oculists (eye doctors) were evidently alert fellows, who practiced their art on good trade methods. Investigations and discussions of old treasures have shown that many of the professional gentlemen carried signet rings or seals engraved with their names, and sometimes address, and bearing some obscure prescription for their favorite formula for eye wash, salve, or callyrium. Probably this signet was as unintelligible as the average modern H, so that the credulous patient had to apply to the medico's pet pharmacist for its proper interpretation. I dare say that these two—doctor and druggist—understood each other just as it is said they do in other countries (of course not in the United States) today.

The French are never so happy as when reporting extraordinary conditions defying the usual explanations of scientific phenomena. Grasset, of Montpellier, for instance, has just given a curious example in a young female, of reading through opaque bodies, reported with far greater accuracy than such manifestations generally are. Dr. Ferraul, of Melbourne, had told Dr. Grasset of this girl. Grasset, to test her, wrote some French with a few Greek and other words, on a card, wrapped it in tin-foil, enclosed this in an envelope, which he sealed with wax. Ferraul went to the girl's house to bring her, but she at once said, "I can read it now" (300 yards away) and immediately dictated to Ferraul the writing on the card. Grasset was informed of her test, and reported the case to the local society. Who can explain this?

The Society of Civil Engineers in Paris has recently made some interesting experiments, in view of the modern use of long range, small calibre rifles, to determine the visibility of different colors at great distances. Gradations from one to eight were used, eight signifying invisibility. The results of observations at 600 meters is as follows: In clear weather *white* is most distinctly visible, (1); then hussar blue (2), scarlet (3), green (4), and the color of dry foliage (7). Dark blue was (6). In cloudy weather white, blue, green and brown remained the same; hussar blue became (3) and scarlet (4). At night the results are the same as in cloudy weather, but white becomes insensible, passing from (1) to (8).

The iron-gray and dark blue of German and Italian infantry were classified as (6). The French uniform with its red képi, dark blue coat and scarlet trousers, was about (4½).

The publishing house of W. Engelmann, of Leipzig, has decided to re-edit the well known *Handbuch der gesammten Augenheilkunde*, first produced under the direction of Alfred Graefe and Theodor Saemisch. The new edition will begin sometime during the year 1899 and, as might be supposed, will be practically a new work. The publishers promise that in every detail—type, paper, illustration and expression—this edition will be thoroughly up to date, although it may take some years before the last article is received from the press. There are to be two parts. *Anatomy and Physiology*, with ten chapters; *Pathology and Therapeutics*, with nineteen chapters, and the names of the writers of the several chapters, men famous the world over for the work they have done in German and other universities, is a guaranty of the excellence we ought to expect.

The Roentgen rays are every day finding new applications, but not the least surprising is the very recent matter-of-fact suggestion of a stolid, prosaic, German doctor, as to their availability in the selection of a bride. The end of marriage being the reproduction of the species, any hindrances to this end which exist, and which may be discovered without subjecting the persons concerned to any indignity, he argues, should be found out before marriage. Any insuperable pelvic contraction may thus be easily detected, and he suggests that *fiancés* should exchange not only ordinary, but X ray photographs, when the preliminary steps to matrimony are being taken. This method, he considers, will be of invaluable service to members of royal and aristocratic families to whom the birth of an heir is all important, and the skiagraph of his beloved will be one of the things that a princeling will be supposed to possess before seriously commencing negotiations for her hand.

W. B. Saunders, 925 Walnut street, Philadelphia, has now in preparation An American Text Book of Diseases of the Eye, Ear, Nose and Throat, edited by G. E. de Schweinitz, M. D., and B. Alexander Randall, M. D. This will be uniform with the other American text books already published by this house, and as it promises to become a volume of eleven hundred pages, fully illustrated, and printed with the excellence characteristic of the others, it cannot fail to meet the approval of all who feel confidence in the ability of the cisatlantic science. Such names as Jackson, Piersol, Buck, Dench, Duane, Knapp, Weeks, Casselberry, Hotz, Casey Wood, Pierce, Alderton, Randolph, Theobald, Burnett, Howe, Gifford, Jennings, Allport, (I have by no means exhausted the list of well known contributors) guarantee us the best of modern facts, theory and practice. The price is (approximately) \$7.00. Further information may be obtained of the publisher, and subscriptions sent in now will be promptly filled on the book's appearance.

I have just received the announcement that the *Clinique Ophthalmologique* is, for November 1, 1897, published in both French and German editions simultaneously, while the scope of the paper will be enlarged to include everything of interest to the eye world. Articles (original) will appear both in German and French, or an exhaustive abstract of the article in one number will appear in the corresponding number in the other language. Reviews are to be especially made, and papers relating to the eye, appearing in any journal—special or general—will be carefully abstracted by a corps of associate editors; such abstracts are to be arranged systematically by subjects.

Matters of clinical interest are to receive the greatest attention.

The *Clinique Ophthalmologique* appears every fourteen days. German edition from Stuttgart (Heusteigstrasse, 37) by Dr. Königshöfer and Dr. Zimmermann; French edition from Paris, (5 rue Saint-Benoit) by Dr. Darier and Dr. Jocqs. Price, 2 marks per quarter (German edition).

It will be of interest to learn that at its meeting, December 29, the University of Chicago in response to a petition from the trustees of Rush Medical College, voted to enter into affiliation with that college. The date proposed for the consummation of the relationship is June 1, 1898, but it is specifically stipulated that the affiliation shall be dependent upon three conditions.

The first condition is, that the board of trustees of Rush Medical College shall be reorganized. At the present time a great majority of the trustees are physicians, who are at the same time members of the faculty. This is acknowledged to be an unfortunate arrangement. The new trustees will be representative business men of the city of Chicago, who have no pecuniary interest in the income of the college.

The second condition provided that the requirements for admission to the college shall gradually be increased, until, in the autumn of 1902, only those who have completed the freshman and sophomore years of regular college work shall be admitted. This proposition, which had already been adopted by the present trustees of Rush Medical College, is a most significant step in the history of medical education.

The third condition relates to the present debt of the college, which amounts to \$71,000. It is provided that affiliation shall not take place until the debt has been paid.

FOR COLLEGE MEN ALONE. It will be the aim of the new trustees, with such assistance as the university may furnish, to develop the work of the medical college along university lines. In the history of Rush Medical College it has always been found that with every increased requirement, the number of students has increased. It is not expected, therefore, that the number of students will be diminished

by the application of the new requirements for admission. It is confidently believed that college men from all parts of the country will be glad to enter an institution to which only college men are admitted.

The history of Rush Medical College during fifty years is one of the most interesting and splendid of any that has been enacted in the educational work of the west and northwest. Its name today in medical circles is held in high honor. It is, of course, to be understood that affiliation does not mean organic union. The degrees will be degrees of Rush Medical College, not those of the university.

The proposed affiliation, however, will give to the university a general supervision of the educational policy of the institution. The trustees of Rush Medical College will continue to be an entirely separate corporation. The trustees of the University of Chicago assume no financial responsibility in connection with Rush Medical College.

FOLLOWING A GENERAL POLICY. This affiliation is a part of the the general policy of the university in accordance with which already many institutions stand in close relations with the university. Whether Rush Medical College will ever become the medical college of the university time will show.

It is important, however, to note that even with this affiliation of Rush Medical College, the university remains without a medical school of its own. The field is therefore open to some friend of humanity to devote one or two millions of dollars for the endowment of a great medical school, the income of which shall be devoted to special research, with which, under any circumstances, Rush Medical College would work in the closest co-operation. With the moral assistance thus gained, the medical college will place itself in a position which, under ordinary circumstances, it could not otherwise have occupied. In thus lending its aid to the medical college, the university performs in part the function for which it was established. In entering into this new relationship with a faculty composed of eighty members, the faculties of the university will join heartily in the wish that even more may be accomplished than is expected.

Peddlers and Eyeglasses.

The mayor of Buffalo, N. Y., will not permit the sale of spectacles in the street by venders, and every license granted to a peddler bears the clause: "No eyeglasses are to be sold under this license." The mayor very properly holds that he has the power to forbid the

sale of spectacles on the ground that the eyes not being sufficiently tested before purchase, great injury might result to the purchaser.

An Abuse of Medical Charity.

Last winter a man presented himself at the New York Ophthalmic Hospital and asked that an operation for cataract be performed, stating that he was very poor. The hospital is partly supported by charity. In view of the man's statement, that he was unable to pay much, the physician in charge reduced the usual \$15 per week to \$5 per week for board and attendance. The man was admitted and stayed several weeks. It was then learned that he was senior member of a large wholesale grocery firm, and was worth about \$150,000. The hospital, therefore, presented a bill for \$200, the full rates; the man refused to pay; the hospital sued, and received a verdict for the amount. Such vigorous treatment applied to a few of the many similar cases constantly occurring would have a beneficial influence upon the community.

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No. 2.

METHODS OF PRECISION IN LOCATING FOREIGN BODIES IN THE HEAD BY MEANS OF THE ROENTGEN RAYS, WITH SPECIAL REFERENCE TO FOREIGN BODIES IN THE EYE.*

BY CHARLES LESTER LEONARD, A. M., M. D.,

SKIAGRAPHER TO THE UNIVERSITY HOSPITAL; ASSISTANT INSTRUCTOR IN CLINICAL SURGERY, UNIVERSITY OF PENNSYLVANIA.

Illustrated.

The enthusiasm which greeted Röntgen's discovery of the X-ray has somewhat abated. A reaction has taken place, and we are now in a position to judge more accurately of the true merits of this method of diagnosis.

It is, however, with special reference to its use in determining the location of foreign bodies in the eye that I desire to call your attention. Many instances have been cited by reliable authors in which it was impossible to find the foreign body "located" by the X-ray, and with rather hasty judgment they condemn the entire method, and say that it is only useful in determining the presence or absence of the intruder, and that localizations are often more misleading than helpful.

They condemn the entire method because, in certain specific instances, it has not been employed in a sufficiently accurate manner to produce precise results.

* Paper read before the February meeting of the Section on Ophthalmology, College of Physicians, Philadelphia.

It is impossible to make accurate measurements of any description by inaccurate methods, or with instruments lacking in precision, and until we apply to localization by the Röntgen rays accurate methods and precise instruments we cannot expect precise results. We must not condemn the method because, when improperly applied, it does not produce satisfactory results.

Among the conditions which add to the difficulties of accurate localization by the X-rays is the fact that it does not produce an absolutely true image. The skiagraph is a shadow cast by rays emanating from a point. The bundle of rays which project this shadow is, therefore, made up of rectilinear divergent rays, and the shadow must, consequently, be larger than the object. Not only is this true, but the parts lying at a greater distance from the point where the rays strike perpendicularly are more distorted. The farther the tube is placed from the object skia-graphed the less distortion will there be produced, as the rays forming the bundle will be more nearly parallel.

The difficulties met with in applying methods of precision to the location of foreign bodies in the orbit, and in eliminating from such observations all sources of error, have led me to bring before you an apparatus for maintaining the foreign body in a fixed relation to a definite point in a known plane, corresponding to a point marked upon the skin of the patient, while a sufficient series of observations are made by the X-ray upon photographic plates, to determine the relation of the foreign body to the point upon the skin and the known plane containing it. During these observations the tube has an altered, yet definitely determined relation to the known point, and from the data obtained we are able to construct a series of triangles, the relational sides and angles of which can all be determined, while the third sides all contain the foreign body, since they are projections of its shadow.

The location of the foreign body, since it lies in each of the third sides, must be at their intersection, and since all the factors of these triangles are known, the absolute location of the foreign body can be mathematically proved. The principle involved in the calculation of the relation of the foreign body to this point in a known plane, from

the data that are thus obtained, is identical with that of the method described by my friend, Dr. C. A. Oliver, before the American Ophthalmological Society in May of last year.

The same principle is equally applicable to the location of foreign bodies any where in the body and always has the advantages of simplicity and infallible mathematical accuracy.

(See ANNALS OF OPHTHALMOLOGY, Vol. VI., No. 4.)

Many other methods have since been brought forward for locating foreign bodies in the eye, based upon mathematical calculations, from a series of observations on one or more photographic plates. Their chief fault lies in the fact that the majority of them base their calculations on points situated too near to the plate, so that their calculations are based upon measurements so small that an error that would be inappreciable in greater distances has a very marked effect upon the final result.

The great advantage of this method over any of these is, that the great distance between the points on which the calculations are based, usually twenty inches, minimizes the effect of any slight error made in taking the observations, while the fact that the localizing point is upon the skin of the patient is a marked advantage over all the methods that attempt to measure from any point upon the eyeball.

In this method any error produced by the movement of the eyeball affects only the foreign body, while in methods based on measurements from a point on the ball, the known point will be moved as well as the foreign body, and hence the error would be double in its effect.

In order to avoid the errors introduced by unconscious movements of the patient, as in respiration, the whole apparatus has been constructed in such a manner that its relational parts are rigidly connected, while the whole is firmly fixed to the individual. Any movement communicated to one part must affect the whole equally and does not alter the known relations of the tube, the foreign body, and the known point, or affect the final result.

The apparatus consists of a yoke that is firmly fastened to the shoulders of the patient. Upon the yoke and ad-

justable in two directions is an upright frame, which serves to hold the head of the patient in a fixed relation to the plate, which it also supports. On the upright frame is an adjustable arm, which carries the X-ray tube. Its angle, relation to the common base (the photographic plates), is variable, in a perpendicular plane and thus it is capable of forming one of the known sides of a successive series of triangles, whose varying third side is the line of the projected shadow of the foreign body.

By a subdivided arc, situated at the juncture of this movable arm and the common base of the triangles, *i. e.*, the frame supporting the plates, the relational angle in any position can be definitely determined, and, consequently, from the two known sides and included angle all the relational sides and angles of any one of the series of triangles may be constructed.

The apices of these triangles are at a point on a line connecting two lead ferrules that slide upon an aluminum wire, and at a known distance from the ferrules. The wire and ferrules are situated in the planes of the movable arm and the frame, and determine the apices of the successive angles made by them, by casting the shadow of the lead ferrules on the photographic plate outside of the field of observation.

This point is, therefore, readily determined upon the plates, and its distance from the upper lead ferrule, when added to the distance of the ferrule from the lower surface of the movable arm, should equal the distance of the focal point of the tube from that surface. The tube is thus placed in a plane of this known point, perpendicular to the surface of the photographic plates. From this known relation of the tube to the known point on the plane of the plates, we are able to determine the distance of the foreign body above or below this plane.

The device for holding the plates permits the interchange of the series without any disturbance of the fixed relation of the foreign body, the tube, and the known point. The fixed relation of the tube, patient, and plate, gives the skiagraph increased definition, as every movement communicated to the head, or plate, is equally communicated to the tube.

By using this rigidly connected form of localizing appa-

ratus we have eliminated from our observations errors which might arise from the following sources, alterations in the relation of the foreign body to the fixed known points, alterations in the relation of the tube to this point, during an observation, through unconscious movements of the patient, alterations produced in the interchange of the photographic plates, and errors due to the obscuring of any portion of the field by the localizing apparatus.

The only remaining source of error is the unconscious motion of the eye. This is a frequent source of error, which I have seen entirely destroy the image of an object whose presence a succeeding series of observations absolutely demonstrated. The best method of overcoming this error is, as many writers have shown, the closure of the eyes.

Attempts to fix the eye upon a definite point are generally failures, as the eye does not sustain the strain readily, and unconscious movements, as in winking, are certain to occur. With the eyelids closed the eye remains quiet, and its position can afterward be readily determined by observing the prominence of the cornea through the eyelid.

The great advantage of this method is its simplicity and infallible mathematical accuracy.

The method of employing the apparatus is the following: The patient is seated in a chair, the yoke fastened to his shoulders and the upright frame placed tightly against the temple, with the head held in position by the band attached to the frame. The fixed point is marked and the tube adjusted in a plane perpendicular to the photographic plate at the known point. The plate is then placed in position. The tube upon the adjustable arm is placed at an angle appropriate to the individual case, the angle noted, and an exposure made; a second plate is then substituted, the angle changed and noted and the exposure made. These exposures are repeated at different angles as often as may be necessary; two, however, usually suffice to give absolute localizations. After the plates are developed the distance of the shadow of the foreign body from the known point is carefully determined, and with the angle and known side in each observation give the data upon which the calculations are based.

The practical determination of the location of the foreign body is greatly simplified by substituting for the mathematical calculations the following graphic method:

The common side of the successive series of triangles, *i. e.*, the series of photographic plates, is represented by a part of the line $P.P'$, (Fig. I.) A point, A , represents the location of the common apices of the series of triangles; one known sides, the distance of the tube on the adjustable arm, is represented by the known sides AB and AC of

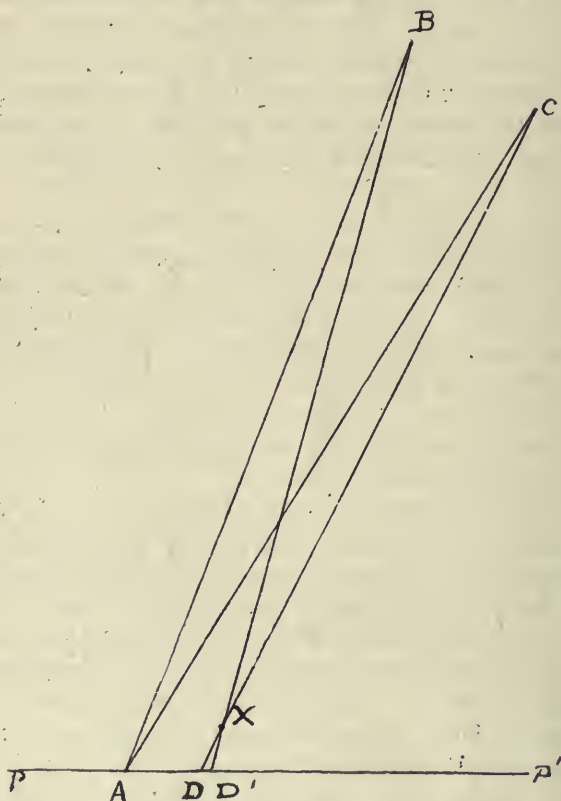


Fig. 1. Graphic method of determining location of foreign body the series of triangles having for each triangle a known relational angle to the base line, *i. e.*, the angles $P'AB$, and $P'AC$, etc. The distances, AD and AD' , are found by measuring the perpendicular distance of the shadow of the foreign body, in the respective plates, from the line that connects the known points. Lines connecting these

points with the points B and C represent the projection of the shadow of the foreign body, which must, therefore, lie at the point of their intersection, X.

We have, therefore, by constructing these triangles from the data obtained, definitely determined the relation of the foreign body to the known points and the plane containing them.

The following is a simple method of utilizing the knowledge obtained in locating foreign bodies in the eye: A piece of cardboard is cut (Fig. II.) so that the point X has the same definite relation to the point, A on the base line, that it has in the drawing. If the card is now bent

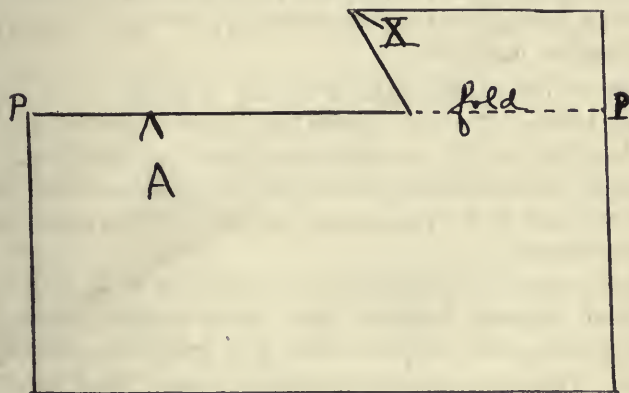


Fig. II. Card diagram used in locating foreign body in eye. Representing two planes perpendicular to each other and the relation of the foreign body and known point in these planes.

to a right angle along the base line, the relation of A and X will not be altered. If it is then applied to the patient's head, with the larger portion of the card occupying the position of the plane of the photographic plates, and the point, A resting at the known point on the patient's scalp, the point, X would rest on the foreign body, since the smaller portion of the card represents the plane perpendicular to the photographic plate in which the point X was found. This, however, would be impossible if the foreign body was within the eyeball. But, if the point, X., is placed upon the surface of the eyeball, the distance from A. to the point on the skin will represent the depth necessary to cut to reach it.

These skiagraphs represent some of the instances of

localization by these methods without the use of the apparatus. In these cases the plate was bound to the side of the patient's head and the head held firmly by a suitable rest with the patient in a sitting position. The tube was adjusted by angles suitable to the individual case traced upon cardboard, the apices of these angles resting on the plate at a point opposite the bony orbital margin, while the common side ran parallel to the plate.

The tube was placed successively at the extremity of the other sides, thus two sides and the included angle were known in all the triangles, while the foreign body was situated at the point where the third sides intersected and could be determined mathematically, or more readily by the graphic method.

Two of these cases also illustrate a group of so called X-ray burns, of which I have had four cases in all. As has been shown by numerous authors, the dermatitis produced is not analogous to the lesion produced by actual burning, and is the result more probably of an interference with nutrition.

These cases occurring in a group as they did, after eighteen months freedom from such results, must have been due to some radical changes in procedures or apparatus. The only change made was in the winding of the coil whereby the amperage of the secondary circuit was materially increased. That this change was responsible for these results is made more probable by the circumstance that at that time the special changes in nutrition which effects the epidermis and nails of the hands of the operator were for the first time observed.

It would seem more reasonable to ascribe the changes commonly known as X-ray "burns" to the action of an agent which we know is always present when they are produced and is capable of producing them, rather than to a hypothetical action of the Röntgen rays of which the physical nature and character are as yet not entirely known.

The stimulating and finally harmful action of electrical currents upon nutrition is well known, and the results seen in the operator as well as the patient are more rationally accounted for by ascribing them to the action of the

static electrical currents, produced in the tissues by their introduction into high potential induction fields, than by any specific action of the Röntgen rays.

The fact that these results were first produced after an alteration in the winding of the coil, which increased the circuit including the tube and coil, and consequently increased the inductive power of the high potential field surrounding them, lends strength to the theory; while the results produced in the operators' hands, which were entirely outside of the X-ray field and only entered the induction field surrounding the coil, confirm the belief that these changes were due to the action of the induction field only. A further proof is seen in the fact that the dermatitis of the hands disappeared so soon as care was taken to avoid as much as practical the induction field.

The most substantial proof of the correctness of this theory lies in the manner in which, according to numerous observers, these burns may be prevented. That is, by introducing into the static or induction field surrounding the tube, and between the tube and the patient, a conductor of electricity that does not interfere with the X-ray, and is grounded by a connecting wire. The static charge is induced on the conducting material of the shield and is led to earth by the grounding wire.

I have lately demonstrated the efficiency of this method of protection in a patient in whom I tested the supposed therapeutic action of the X-ray. This patient protected by the grounded shield was exposed daily for three weeks, with the tube in close proximity to the tissues, and with an average daily exposure of twenty-five minutes. There was no indication of dermatitis and no therapeutic action.

In a case of vesical calculus where the stone was demonstrated, an extensive dermatitis of the abdomen was produced. A second exposure under identically similar conditions, with the exception of the introduction of the shield, had no effect upon the newly formed epidermis, while the skiagraph obtained was equally good.

It would seem to me that the results which have been reported ascribing to the X-rays a therapeutic value, belong to the action of the static charge induced in the tissues.

The results lately reported of its action upon bacteriological cultures are readily explained upon this basis. The action of static charges upon such cultures has long been known. The culture gelatine forms the media for the accumulation of the static charge, while the glass plate prevents its discharge. All the action attributed to the X-ray is therefore accounted for by the static change.

The immediate and remote results of this dermatitis are never very serious though the healing process is tedious. In all of my cases the healing has been complete, except perhaps the return of the hair, and in none of the cases cases reported in literature has there been produced, so far as I know, any permanent injury.

Attempts at the removal of hair by this means have signally failed.

The best treatment seems to be the use of ointments whose base is lanoline with ten per cent. of petrolatum, combined with boric acid, zinc iodide, or ichthyol which have all produced good results in my cases.

The dermatitis produced by the X-ray exposure is therefore never serious, is due to the static charge induced in the tissues of the individual, and may be prevented by placing a grounded conductor as a shield between the tube and the patient.

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LOCATING FOREIGN BODIES IN THE EYE BY MEANS OF THE ROENTGEN RAYS.*

BY WILLIAM M. SWEET, M. D.

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One year ago, at the invitation of the Section, I presented a preliminary report on the localization of foreign bodies in the eye by means of the Roentgen rays. At that time the value of the new form of energy as a means of determining the presence of pieces of metal in the eyeball had been fully established by Williams and Clark, and particularly by the achievements of Stern at the Philadelphia Polyclinic. The great advance made in the methods of generating the rays has led me to considerably modify the apparatus at first employed for indicating the approximate position of the bodies in the eye. I now use a plate-holding apparatus attached to the side of the head, to which is fixed two metal indicators, one pointing to the center of the cornea, and the other situated at a known distance from the first to the temporal side.

Two radiographs are made to give different relations of the shadows of the indicators and the foreign body, one with the tube horizontal or nearly so with the plane of the indicators, and a second with the tube at any distance below this plane. Since the shadow of the foreign body preserves at all times a fixed relation with respect to the shadows of the two indicating balls in whatever position the tube is placed, the location of the body may readily be determined. For this purpose two circles are drawn, one to represent a horizontal and the other a vertical section of the normal eyeball, and upon these circles are noted the relative position of the indicators when the exposures were made. If measurements of the position of the shadow of the foreign body on the radiographs in respect to the shadows of the indicators are entered upon these circles, and lines drawn through the points of measure-

*Read before the Ophthalmic Section, College of Physicians of Philadelphia, March 15, 1898.

ment, the position of the foreign body in the eye must be at the crossing of these planes of shadow of the two exposures.

The various methods which have been employed in locating foreign bodies in the eyeball or orbit resolve themselves into a determination of the angle of the X-ray tube with the foreign body and with one or more dense objects situated near the eyeball. Approximate results have been obtained from a study of the shadow of the foreign body in relation to the shadows of the orbital bones, but owing to the variations in the position of the eyeball, which have been shown by the investigations of Cohen to amount in healthy individuals to as much as 10 mm. behind the edge of the orbit and 12 mm. in front of the same, this method does not equal the accuracy possible by other means.

Whatever form of indicating object is used in working out the position of the foreign body, there are certain factors which I believe to be of importance in achieving accurate results.

1. A tube should be used which may be run at high vacuum, in order that the rays readily penetrate the bones of the head.

2. The patient should be in the recumbent posture, this position ensuring greater steadiness of the head and body than when some form of head rest is used.

3. The visual axis should be parallel with the plane of the plate at the side of the head, or, if it deviates, the angle should be measured, and allowed for in the determinations.

4. The situation of the indicating objects with respect to the center of the cornea in each individual case should be known, otherwise the determination of the location of the foreign body will vary with the varying situation of the eyeball in the orbit in different persons.

5. The angle of the tube with the indicating objects must be accurately measured. The use of the two indicating balls enables this to be done very accurately, since by this method the angle of the point on the platinum of the tube from which the rays come is measured. The two indicators being parallel with each other and with the plate, and both perpendicular with the plate, the distance

the shadow of one of the balls is posterior to that of the other is the measure of the distance that the source of the X-rays is carried to the front.

The method has been employed in a number of cases of suspected foreign bodies in the eyeball or orbit, in seven of which the shadows of the bodies were obtained on the plate, and their position indicated. Three of the cases were gunshot injuries, in which the findings were not verified by subsequent operation. One case was sent to me by Dr. G. E. de Schweinitz, one shot being located in the left eye and one in the right orbit outside of the eyeball. Two cases of gunshot injury were skiagraphed for Dr. H. F. Hansell, in one of which the shot was located at the apex of the orbit, and in the other patient the position of the several shot were indicated, one in the eyeball, one in the orbit beneath the superior orbital ridge, and one in each nasal cavity. Recently I made several radiographs of a patient for Dr. de Schweinitz, in which the piece of metal was located 10 mm. back of the center of the cornea, 3 mm. to the nasal side, and 11 mm. below the horizontal plane of the globe. After the radiographs had been made the pupil was thoroughly dilated, and upon rotation of the eye downward a patch of choroidal atrophy with a small patch of black in its center, could be seen in the position which the photographs indicated should be the location of the foreign body. A further verification of the findings of the X-rays was the development of a spot of tenderness upon palpation of the sclera with a probe in the region mentioned.

Actual demonstration by operation of the correctness of the method of localization has been shown in the case reported by Dr. William Thomson,* and in the patient shown by Dr. Hansell this evening. In the latter case the radiographs recorded the shadows of two metal bodies, one in the posterior chamber immediately under and to the nasal side of the lower end of the vertical diameter of the lens, and the other just anterior to the external orbital angle, and very close to it, in the soft tissues of the upper lid. The presence of the body in the lid could not be ac-

* Transactions American Ophthalmological Society, Vol. VIII., Part I.

counted for by the patient, as there was no evidence of it having entered the tissues at the time of the recent accident. Both bodies were removed from the situations indicated by the radiographs, and the eye made a good recovery, vision, however, being restricted to the recognition of large objects on account of blood in the vitreous.

While the apparatus previously described is applicable to the location of bodies in the eyeball and immediately surrounding tissues, its usefulness for other situations is limited by the small photographic plate used. Recently Queen & Co., of this city, have made for me an apparatus constructed upon the same principle, which may be employed for locating foreign substances in the head or any other part of the body.

It consists of two pieces of wood firmly bound at right angles to each other. Upon one of the surfaces is a receptacle, covered with celluloid for holding the X-ray plate, while the same board carries the support for the indicators. These indicators are at a known distance apart and are at all times parallel with each other and with the plate and perpendicular to each other and the plate. When used for locating bodies in the head one indicating ball rests at any known point, and the plate is fixed to the side of the head. In the determination of the position of bodies in the arms or legs, the apparatus is reversed, with the plate beneath the part. So far the apparatus has been employed experimentally with satisfactory results.

COMPLICATED CATARACT; A CLINICAL LECTURE.*

By S. D. RISLEY, M. D.

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In my last lecture I brought to your attention the subject of hard cataract, and the operative procedures usually adopted for its removal. Today I present for your consideration another and very important group of patients also afflicted with opacity of the lens, but presenting certain complications which should always suggest to the surgeon the need for a guarded prognosis. The main features of the group are illustrated very definitely by the patient I bring to you for study. She was referred to me for advice, and operation if necessary, by Dr. Barrington of New Jersey. She is 52 years of age, not in robust health, and has been afflicted with steadily failing vision for more than three years, until at present she is able to see only the largest test letters with difficulty at a few feet, and at the near point with her reading glasses only very large type can be with difficulty deciphered. She relates that her eyes have never been strong, that she has most of her life been subject to attacks of "sick headache" which came on at frequent, but irregular intervals, and were often so severe as to confine her to bed in a darkened room. Between these explosions of pain she suffered more or less constantly with a dull fronto-occipital headache, which was aggravated by exposure to bright lights, to the heat from a lamp or her kitchen stove, or by any protracted effort to read or sew. These symptoms have all been worse for the past three or four years, until she has been compelled to relinquish all use of her eyes. During this time the vision has rapidly failed until she is able to attend to only the coarsest of her household duties.

*Delivered at the Polyclinic Hospital, March 17, 1898.

There is no organic general disease other than a rheumatic tendency. At times her eyeballs are "sore," by which she means that they are tender to palpation, and she has observed that at such times her head pains her worse. She then has aggravated occipital pain which radiates to the temples, down the neck and to the shoulders. The pupils react promptly to light and shade, but at present are dilated by a solution of homatropine hydrobromate, which she has been using three times daily for a week with great relief from her headache. At her first visit no glasses improved her vision, but today the ophthalmometer shows a low grade of astigmatism against the rule, higher on the left side. She selects for O. D. — 3. \ominus .50c ax. 90°, V. = 5/LX. O. S. — 5. \ominus —1.c ax. 90°, V. = 5/LX, but complains of the blur over her eyes. No ophthalmoscopic study of the fundus was possible through the narrow pupils, but with the present dilation we are able to discover a most interesting and important group of conditions. With oblique light you will observe that the corneæ are transparent, but that the lens in each eye reflects the light strongly and appears yellowish white throughout. Indeed, it appears so nearly opaque that one is surprised, when with the ophthalmoscopic mirror the red reflex from the fundus seems so nearly normal. Any effort to study the details of the fundus, however, is disappointing, for only a blurred image is possible. There are no spicules of opacity in the lens, but when it is studied with + 8. D. behind the sight-hole of the mirror, the nucleus is plainly outlined and appears granular. When the eye is turned slightly downward in order to see around the partially opaque nucleus, a gray disk-like opacity can be made out at the posterior capsule of the lens, a commencing posterior polar cataract. Behind this can be seen through the comparatively transparent periphery of the lens a veil-like web floating freely to and fro with every movement of the eye. The details of the fundus are seen as through a fog, and the nerve is entirely hidden from view, although its location can be made out by the convergence of the vessels of the retina which can be seen in the periphery of the ophthalmoscopic field. The tension of the ball is normal, and her field of vision perfect.

We have then, in this patient, a group of subjective symptoms associated with disease of the lens, vitreous body and fundus, which doubtless sustain to each other some definite relation. The long history of asthenopia associated with the profound ocular disease which we have seen, is of great interest. That the pathologic conditions present were the cause of her weak eyes and headache seems quite positively demonstrated by the clinical history. The chronic inflammatory changes of the eye which were the cause of the asthenopia have slowly undermined the nutrition of the eyeball. As a result the vascular structures, the vitreous body and the lens, have failed of their proper nourishment and are undergoing degenerative changes. The liquification of the vitreous is demonstrated by the freedom with which the opacities float with every movement of the ball.

I now call your attention to the history of another patient, a young woman aged 21, who illustrates with remarkable clearness the influence of disease of the intra-ocular tunics in the etiology of cataract. She was first seen when 12 years of age. She was brought to my office because she could not see writing on the blackboard at school, and for relief from violent headaches, weak and painful eyes which were subject to attacks of redness and profuse lacrymation on exposure to strong light, O. D. V. = 6/xix, O. S. V. = 6/xxx. She had a profusion of almost white hair, the eyebrows and ciliæ were white, and a faint reflex from the fundus could be seen through the lightly pigmented irides. In places the choroidal circulation could be seen, but for the most part the fundus presented a uniform fluffy appearance. The retinal veins were large, the optic nerves veiled, and the retina striated in their vicinity. In both eyes there was a broad crescent of choroiditis embracing the temporal margins of the nerves, but in the left also a patch of choroiditis with pigment absorption in lower temporal quadrant. The refraction was highly hypermetropic, careful measurement, after the prolonged use of a mydriatic, showing for O. D. + 2.50 \subset + .50cy ax. 75°, V. = 6/ix; O. S. + 3.50 \subset + 1.00cy ax. 105°, V. = 6/xii. The finger tips were bulbous, the lips thick and pendulous, the nose large and

stuffed with baggy hypertrophies hanging from the turbinals. The tonsils were hypertrophied. She received internally, iodid of iron and cod liver oil with lacto-phosphate of lime, while careful attention was given to her general regimen. The eye conditions and general health steadily improved, and the headache disappeared. The correcting glasses were worn steadily and with great relief until the following year, when she returned complaining once more of her dim distant vision and headache, dread of light and inability to use the eyes. The fundus presented again much the same condition as when first seen, but the crescents had increased in size and were semi-atrophic, while in the macular region and between the fovea and the nerve, granular changes were visible. The general health was greatly improved, and there was a marked increase in the pigmentation of the hair, skin and irides. The treatment before prescribed was advised, and a remeasurement of the refraction made after the prolonged use of a mydriatic and smoked glasses.

It was now found that the refraction of the left eye had increased by 1.50 D., the astigmatism remaining unchanged. The child was taken from school for three months. The condition of the fundus slowly improved, but vision had fallen to 6/xv in O. S. and could not be further improved by glasses. She remained more or less regularly under observation until 1893, with many recurrences of increased trouble, and then disappeared for two years. The hypermetropia had again diminished, while the fundus changes in the left had increased with a corresponding fall in the sharpness of sight, which was in part due, however, to a commencing opacity in the posterior capsule of the lens. In spite of the treatment this increased rapidly, and in a few weeks the entire lens became opaque. The right eye responded favorably to treatment, and the headache disappeared. In 1895, a single discission was performed on the left lens which rapidly absorbed, leaving a clear black pupil through which, with the correcting glass, she has V. = 6/xii. Her health has steadily improved, the hair, the eyebrows, and ciliæ are darker, presenting the coloring of the usual blonde, but the right eye has occasional recurrences of retino-cho-

roidal irritation and will not bear continuous work. The naso-pharyngeal condition have also improved under local treatment.

Many points of great interest are presented by this history. First in importance is the evident participation of the ocular tunics in the general impairment of the vital functions in this girl during the years of adolescence. Aside from this, however, were the increase of refraction due to obvious distension of the readily yielding sclera, associated with choroiditis in both, and opacity of the lens in the left eye, which, at the start, had the higher defect of refraction and manifested throughout the history, extending over nine years, the more serious pathologic conditions. There can be no reasonable doubt that the cataract in this eye was caused by the impaired nutrition due to the choroidal disease. That the choroiditis was not solely due to the general impairment of nutrition seems probable by the arrest of all disorder after the removal of the lens, and the subsequent neglect of the eye for purposes of accurate vision, while the right is still subject to recurring attacks of irritation and lowered sharpness of vision. It is probable, therefore, that had these eyes been emmetropic at the start, they would not have been more liable to disease than the other organs. I have shown elsewhere that a very large percentage of all cases of incipient cataract furnish a history of asthenopia and exhibit errors of refraction which have subjected the eyes to life long strain and irritation, which sooner or later, especially when associated with certain constitutional dyscrasiæ, lead to pathologic conditions of the *fundus oculi*, one sequel of which is the opacity of the lens.

The question of greatest interest to the patient before us today is, what can be done for the improvement of her vision? There is no form of ocular disease which requires more cautious and skillful management. If no treatment is undertaken the pathologic changes will probably advance and the cataracts slowly ripen. Then an attempt to extract them may be made. But if seen for the first time, when fully ripe, by the surgeon, it is probable that too favorable a prognosis would be entertained, since it would then be impossible to discover through

the opaque lens the diseased intra-ocular membranes. The perception and projection of light would be good in all parts of the field of vision, as taken with a candle flame. There would be no means by which the existence of a fluid vitreous with floating opacities, the diseased choroid and the opaque posterior capsule could be anticipated. It is true, that the long history of asthenopia should put the surgeon upon his guard, but all inquiry in this direction is too often omitted. Then, too, the homogeneous, amber colored lens would also be ominous. It is in such cases as this, after the cataracts have ripened, that we find the difficulties which so frequently disappoint us in their extraction, *e. g.*, loss of a fluid vitreous, tough capsule, difficult or impossible toilet of the eye, and dense or tough secondary cataracts. The convalescence of such eyes after extraction is tedious. They are subject to low grades of plastic iritis, which may come on soon after the operation, incited by the traumatism; or, the nearly painless inflammation may be deferred to the seventh or eighth day, when the iris is found discolored and attached to the capsule by synechia. Not infrequently the eye gradually softens and shrinks from a chronic irido-cyclitis. It is important, therefore, that the surgeon should give a guarded prognosis, whenever he is able to elicit such a history as this woman has given us today.

The cataract however is not ripe, and for the present, notwithstanding her poor vision, no operative procedure is advisable. It is nevertheless important for her future that something should be done now. Fortunately, she can be made more comfortable, and I think that under proper treatment the pathologic conditions of the fundus can be ameliorated. She has been using a solution of homatropin hydrobromate gr. vi to the f3i, three times daily for a week, and has worn smoked glasses when exposed to bright light. She was also instructed to avoid the heat from her kitchen stove, and to make no attempt to use her eyes. Under this treatment her headache has disappeared. This treatment will be continued, and she will receive in addition a mixture of iodid and bromide of potassium. The secretions will be carefully studied, her diet regulated, and daily exercise in the open air enjoined. It is probable that

under these measures we shall find a slow, but steady improvement in the eyes. The opacity of the lens may advance, and probably will do so, but in that case, when the cataract is ripe for extraction the probability of a successful issue will be much greater than it would be if this treatment had been neglected.

The operative procedure to be adopted in the group of cases represented by this patient is both interesting and important. It will usually be found that in these chronically inflamed eyes, the iris will not dilate widely. I have made it a rule for my own guidance not to attempt simple extraction when the pupil will not respond well to a mydriatic. I have pointed out the difficulties which are to be anticipated in operating upon such cases, but these are much less with iridectomy than without. Then, too, the attempt to deliver a large lens through the narrow unyielding pupil adds greatly to the danger of serious traumatism. It may be said that iridectomy causes a much greater injury to the iris, but experience has taught that the removal of a segment of the iris is much less prone to cause trouble than the bruising and stretching caused by forcing the lens through a rigid pupil and by the replacing of the inevitable prolapse which occurs at the moment of its delivery. The safest and best procedure is a preliminary iridectomy, to be followed in a few weeks or months by the extraction of the lens. I believe that this plan should be adopted in all cases of cataract complicated by serious intra-ocular disease. In many cases the iridectomy unquestionably exerts a beneficial influence over the disease of the intra-ocular membranes, probably by facilitating the excretion of the intra-ocular fluids as in glaucoma. In many cases it should be done early, during the stage of incipency of the cataract when it, in some cases, seems to hasten the ripening of the lens. I have long since, however abandoned the operations designed for this purpose, preferring to risk the extraction of the semi-transparent lens. After artificial ripening, the cortex adheres to the capsule much more tenaciously, making the toilet of the eye extremely difficult, or impossible with any safe amount of manipulation. Moreover, it will be found usually that only the an-

terior cortex has been influenced by the ripening operation.

Even after successful extraction, unless the lens has been removed in its capsule, secondary cataract is the rule in these patients. The posterior capsule is opaque to start with, and must be incised before a clear image can be perceived upon the macula. It will in most cases be found tough and unyielding, so that in the attempt to cut it, two secondary cataract knives will be required. They should enter the eye from opposite sides of the cornea, and be caused to penetrate the membrane at its center, then separated, cutting in opposite directions, the one forming a base of support for the other, so that the tough capsule may be cut or torn asunder without making traction upon the ciliary region or iris.

CONGENITAL SHORTENING OF THE LOWER LIDS, COLOBOMATA OF THE UPPER EYELIDS.*

L. A. W. ALLEMAN, A. M., M. D.

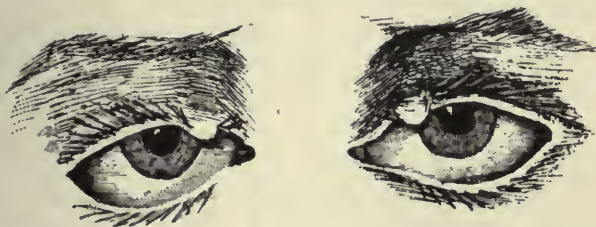
BROOKLYN, N. Y.

ILLUSTRATED.

The patient, a boy 8 years of age, presented himself at my clinic at the Long Island College Hospital, on account of asthenopia, from which he suffered when in school, and for relief of the deformity of his eyelids, which subjected him to the ridicule of his playmates. The lad was healthy and presented no other deformity. The eyes were normal in appearance; vision $20/20$ in either eye, and no lesion was revealed by the ophthalmoscope.

The total hypermetropia under homatropin was .75 which was given him as a reading correction. The only interest in the case attached to the deformity of the lids which gave the child a peculiar and uncanny look, and which is fairly well shown in the accompanying cut.

The lower lid of the right eye was markedly shortened, particularly at the center, and the lid margin curved down from the canthi.



The orbicularis was so imperfectly developed, that it could not approximate the lid closely to the ball, and the conjunctiva thus exposed looked like a red setting to the white sclera.

The lids, even under extreme effort at closure, failed to meet at the center by about 5 mm., and the cornea was protected by upward rotation. When the eyes were opened the shortened lids gave the appearance of an exophthalmos. These bulging eyes with their red rims gave the child a peculiarly ferocious look, which in contrast to the timid and delicate face, was intensely ludicrous.

At the junction of the inner and middle third of the upper lid was a Δ shaped defect extending through about a third of the lid in a vertical direction and about 5 mm. in breadth at the lid margin. It

*Read before the Hospital Graduates Club of Brooklyn, December 31, 1897.

involved the whole thickness of the lid and was not bridged over in any part, nor were there any adhesions to the ball. A strong growth of ciliae on the outer margin partially concealed the cleft. There was no deformity at the punctum, and no abnormal growth nor other developmental anomaly about the eye.

The left eye presented similar defects, save that the lid was not so short nor was the coloboma as marked, being little more than a notch at the lid margin. There was a slight amblyopia, as is usual in such cases. V. $20/30$ as above, and this was not improved by the use of a correcting glass.

Congenital colobomata of the eyelids are of comparatively rare occurrence. The deformity is most commonly situated in the upper lid, and varies in extent from a slight indentation of the lid to a cleft reaching to the orbital margin. The defect is usually triangular in shape, with the base at the lid margin. In 1888, Dor and Nicolini collected 46 cases of lid colobomata which had been reported up to that time. Of these, 27 had one lid affected, 16 had one lid of each eye, and one had all four lids involved.

This deformity is usually associated with some other congenital defect, such as hare-lip or absence of the lachrymal puncta. Dermoid cysts are also frequently found with colobomata, and adhesions between the lid and ball are common.

Dor and Nicolini explain these cases as the result of a faulty closure of the oblique facial fissure, which view has been generally accepted. Hoppe (*Jahresbericht Ophthal.*, '97, p. 221), attributes the defect to pressure of the amniotic fluid and a consequent adhesion, which is in line with one of the theories advanced to explain dermoid cysts of the eye and congenital deformities of other parts of the body.* It is interesting to note in this connection that the mother informed me that in this instance the labor was very dry.

The shortening of the lower lid here presented is a much more infrequent condition; shortening of the upper lid is sometimes observed, but I have failed to find in the literature at my command any report of an exactly similar condition.

Denig (*Archives of Ophthalmol.*, XXVI, 259,) reports a case of a girl of 17, in whom the outer commissure on both

*See also Goldzieher, *Centralblatt f. prak. Augenheilkunde*, December, 1896, p. 359.

sides stood out somewhat from the eyeball, so as to form a pocket as large as a pea, but the lid could be closed. The face presented a peculiar appearance, like that following a burn. The angles of the mouth were drawn down and out; in the neck several ribbon-like tracts ran upward to the lower jaw, ear and mastoid. This condition he attributes to a general shortening of the platysma.

In the case here reported, there was no bands and no loss of the normal mobility of the skin; but there was evidently a lack of development or loss of tone in the orbicularis.

In the discussion of this paper Dr. A. C. Brush called attention to the frequent association of congenital deformities of the eye with other so-called stigmata of degeneration, and he kindly consented to examine the child. His findings were to me most interesting, and I append his report herewith:

* * * "I note the following stigmata besides the malformed lids: The head is unnaturally long in its mento-occipital diameter. The forehead is low, narrow, and protruding. The crown of the teeth in the incisors instead of being smooth, presents two notches, giving three points to each tooth, a condition normal in reptiles. The upper two incisors in the middle line are separated and the palate is high, narrow and triangular resembling that of the wolf and dog. The lower jaw is unnaturally heavy, square and prominent. The ears are the triangular bat-like ones, projecting from the head with which people have for centuries adorned the devil, recognizing, no doubt, the peculiar traits which go with them."

PARTIAL BILATERAL IRIDEREMIA.—MONOCULAR MULTIPLE IRIDODIALYSES.—IRIDIC ATROPHY.—GLAUCOMA.

BY JOHN DUNN, M D.

RICHMOND, VIRGINIA.

(Illustrated.)

Mr. G., aged 35, has always had imperfect vision. About a year ago his sight became worse and has since then steadily diminished. When first seen, July 9, 1897, V. O. D. = $\frac{3}{80}$; O. S. = outlines of objects held between him and the light.

O. D. Cornea and anterior chamber are normal. Lens is slightly tremulous and shows some areas of faint cloudiness at different locations around the periphery of its nucleus. The central pupil extends over one-third of the anterior surface of the lens and is irregularly oval in shape, its upper border being almost a straight line.



Peripherally, below and externally, are three iridodialyses, no iris tissue being present for these areas. The iris itself is divided into two parts, one of which consists of normal iris tissue, complete; the other only of atrophied pigmented tissue. To the naked eye, a small segment of the iris, situated upward and inward, 1 mm. wide and 4 mm. long, (vid. Fig.) is yellow in color, has the normal iridic sheen, together with some of its contraction furrows; *Examined with the ophthalmoscope, this fragment of iris tissue is seen to dilate and contract, under light thrown into the eye.* The second portion-surrounding the rest of the central pupil is, to the naked eye, brown and smooth, showing nowhere any contraction furrows; under the ophthalmoscope this second part is seen to be thin, the red reflex from the fundus being everywhere visible through it; under a 20 D. sph. lens it is seen to consist of coarse, rough, pigmented, atrophied fibres, whose general direction is from the periphery toward the

pupillary margin, and whose appearance is not unlike the denser part of a dusty spider's web. *This portion of the iris tissue does not respond to the light reflex.* This second part can be distinctly seen to pass beneath the first, where they meet. The vitreous is normal. *The optic disc shows a very high degree of glaucomatous excavation.* The tension is +. In places the retina is atrophied. No congenital abnormalities of retina or choroid. Refraction — 4 D. sph.

O. S. Cornea and anterior chamber normal. Lens is slightly tremulous and, besides showing opacities along the nucleo-cortical junction, *is incomplete for a part of its periphery below and externally.* For one-half of the circumference there is a total absence of iris tissue, the pupil covers about three-fifths of the anterior surface of the lens, and is sector shaped. For the other one-half of the circumference, the iris is represented by the same dull brown, rough membrane, described in O. D. Upon this membrane is developed a small area of normal iris tissue, yellow in color, and *having the property of contracting in response to the light reflex, a property denied to the rest of the iridic membrane.* The normal iris tissue extends from below upward as a narrow band about $1\frac{1}{2}$ mm. wide. It is connected with the ciliary body only below, the brownish color of the subjacent layer being everywhere else plainly visible as a band about 1 mm. wide between it and the periphery. Extending across the angle of the pupil is a brownish cord, and it is noteworthy that the filament extends from the upper limit of the band of normal iris tissue to the lowest point at which this normal tissue reaches the pupillary margin. Examined under the ophthalmoscope, the brownish membrane everywhere, just as in O. D., shows through its meshes the red reflex; while under a + 20 D. sph. lens it is seen to consist of coarse, rough, pigmented, atrophied fibers, whose general direction is that of the pupillary edge. As in O. D. the optic disc is glaucomatous to a high degree. Tension +. Refraction — 2 D. sph. Fundus, save for slight changes, probably the result of the glaucoma, is normal.

The above pictures are interesting as to results. Unfortunately, however, the steps by which these results were reached are altogether wanting. The patient was stupid, and could throw no light on the subject. For a year his eyesight, which had always been imperfect, had been growing worse, and during this time his eyes had been painful, but never enough so for him to consult a physician.

The question arises whether the condition of the iris above described could have been caused solely by atrophy, the result of glaucoma. Fuchs says that in some cases of glaucoma "the ciliary processes squeezed in between the sclera and the margin of the lens, push forward and press the root of the iris against the sclera and cornea. By a process of simple adhesion the periphery of the iris remains perfectly connected with the sclera and cornea," and "atrophy of the iris results."

Granted, in our case, that all of the iris tissue, save that represented by the two small bands of yellow, underwent atrophy, we have then to explain the occurrence of the multiple iridodialyses O. D., and the shape of the pupil O. S. It is possible that the central pupil O. D., as now seen, represents approximately its size and shape as it was when the glaucomatous attack which produced the iridic atrophy was at its height; the iridodialyses may have been produced at the same time, or later during the occurrence or subsidence of other glaucomatous attacks. If now the narrow band of tissue crossing the angle of the pupil O. S., be considered as the atrophic remains of the sphincter pupillæ, it is easy to see how by a slight further separation of the iris at its periphery and by the occurrence of a split through its center, the sector-shaped pupil could be produced from a condition similar to that seen in O. D. That such was the case is rendered the more probable by the direction of the atrophic fibres along the margin of the sector-shaped pupil (they run more or less parallel to the margin) and by the further facts that these fibres are longer and more massed than they are anywhere over the atrophic area O. D., where, moreover, they are for the most part at right angles to the pupillary edge. It is to be noted that both corneæ are perfectly transparent, there being no traces of the permanent cloudiness which is sometimes caused by attacks of glaucoma. There are no evidences of present iridic adhesions to the cornea, although on the anterior surface of the left lens near the center, are two or three minute remains of iridic pigment. Perhaps the most interesting part of the picture are the two existing remains of healthy iris tissue responding both directly and consensually to the light reflex, and especially so, that to be found in the left eye, suggesting as it does a very free system of anastomosis for the iridic vessels. How these two iridic segments escaped the pressure which resulted in the total atrophy of the remainder of both irides is a question I do not undertake to answer. At first sight one thinks of congenital irideremia, knowing as we do how often glaucoma occurs in eyes having this anomaly. In the presence of the condition now existing, such a suggestion helps but little; for the iridic tissue must first have developed before it could atrophy. Unfortunately the patient lives at too great a distance in the country for me to ever hope seeing him again. The case, therefore, is reported to show one of the rare pictures, which may develop in the course of glaucoma, but whether the latter was in this case congenital or acquired, must remain of a matter of conjecture.

WHY BIFOCAL SPECTACLES ARE SOMETIMES UNCOMFORTABLE.

BY ARTHUR G. BENNETT, M. D.

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Probably most ophthalmologists have patients who can not wear bifocal spectacles with comfort, and yet who can wear the same reading and distant correction in separate frames with decided benefit. Why this should be so, is sometimes a perplexing question. The most popular theory is, that the line of junction between the segment and the main glass is the disturbing element, and when the spectacles are badly adjusted, so that the segment interferes with distant vision, this is probably true, but in cases in which the adjustment is perfect and the refractive correction exact, this explanation will not suffice; we must, therefore, search farther for the cause of this discomfort, and in many cases it will be found in the incorrect centering of the lower segment. My attention was first called to this as I was examining a pair of bifocal spectacles brought in for my inspection by a patient. I was struck by the extreme upward displacement of the test-type while neutralizing the lower segment, and found on careful examination that the decentration was equal to a prism of 4 degrees with the base down. The decentration was of the same amount in each eye, and as this was before the days of kato and anophoria, I passed the glasses as correct. Such a pair of spectacles now would not satisfy me. Often have I found bifocal glasses with a decentration of the lower segments unequal. In a pair I examined a few days ago there was a difference of 3 degrees, and this pair was made by an up-to-date optician. In his endeavor to make a fine joint and turn out a workmanlike pair of spectacles, the fact that there was a difference of 4.00 D. between the

two main lenses, with a necessary difference in prismatic effect was overlooked, which oversight necessitated the making of a new pair of spectacles at his expense.

The geometric center of the lower segment in a bifocal lens runs from 7 mm. to 10 mm. below the geometric center of the main glass, varying according to the size of either and the fashion prevailing at the optician's. The point, therefore, through which a patient must look when using near vision, is from 7 to 10 mm. below the optic and geometric center of the main lens.

In the following table the effect of decentering a spherical lens from 7 mm. to 10 mm. is given in prism degrees.

Diopters.	7 mm.	8 mm.	9 mm.	10 mm.
0.25	0.19°	0.22°	0.24°	0.27°
0.50	0.38	0.43	0.49	0.54
0.75	0.57	0.65	0.73	0.81
1.00	0.76	0.87	0.97	1.08
1.25	0.95	1.08	1.22	1.35
1.50	1.14	1.30	1.46	1.62
1.75	1.33	1.51	1.70	1.89
2.00	1.51	1.73	1.95	2.16
2.25	1.70	1.95	2.19	2.43
2.50	1.89	2.16	2.43	2.70
2.75	2.08	2.38	2.68	2.98
3.00	2.27	2.59	2.92	3.25
3.25	2.46	2.81	3.17	3.52
3.50	2.65	3.02	3.41	3.79
4.00	3.03	3.46	3.90	4.33
4.50	3.41	3.90	4.38	4.87
5.00	3.79	4.33	4.87	5.41
5.50	4.16	4.76	5.36	5.95
6.00	4.54	5.18	5.84	6.49

If the lower segment is accurately centered optically before it is cemented on, there will be no alteration in the prismatic effect of the main lens and the result in prism degrees will be that shown in the foregoing table. But in order to turn out artistic work, the optician grinds the upper edge of the segment to a razor like fineness and leaves the lower edge thicker so that the segment itself is a sphero-prism. For economy's sake, also, two segments are often cut from one lens, in which case neither has an optical center but are both sphero-prisms.

In cases of Hm. and P. the main lens will be of course a plus sphere and the point through which the patient must look when using his eyes for near work will be from 7 mm. to 10 mm. below the optic and geometric center, and the effect will be that of a prism base up, but this

prismatic effect will be largely overcome by the segment, if it is made as it usually is, with the upper edge ground thin, as the segment will have the effect of a prism with the base down. The nearer the two coincide in refractive strength the less will be the prismatic displacement. For instance, suppose a patient with 2.00 diopters of hyperopia with an additional 2.00 D. of presbyopia, requiring glasses that have a distance of 8 mm. between the geometric centers of each lens, there will be a prismatic effect at the lower center before the segment is cemented on of 1.73 degrees base up, but this can be neutralized exactly by decentering the segment 8 mm. If, however, the main lens exceed the segment in strength, either the latter must be decentered still farther, or a prism ground in, in order to get an optic center, or, as is more usually the case, the reading correction is left improperly centered.

It is, however, in cases of myopia and anisometropia that the greatest difficulties occur. In myopia we have exactly the reverse condition to that found in hyperopia. If a plus lens with the point of vision below the optic center gives the effect of a prism with base up, a minus lens under like conditions will give the effect of a prism base down. As myopia is apt to run into very much higher degrees than hyperopia, and requiring for its correction correspondingly stronger glasses, so will the prismatic displacement be necessarily greater. The effect also of grinding the segment with a razor-like upper edge, instead of tending to neutralize this displacement, only exaggerates it, and what was bad before, is made worse. A prescription somewhat like the following is not uncommon: Right and left for distance — 6.00 d.sph. For reading — 3.00 d.sph. in bifocals. If the distance between the geometric centers of the distant and reading correction is 8 mm., the effect of such a pair of lenses will be that of a pair of prisms, base down of 7.77 degrees. The main lens 8 mm. below the optic center has a displacement equal to prism 5.18 degrees base down, and the reading correction, which will be decentered probably the same amount, a displacement equal to a prism base down of 2.59 degrees. Our unfortunate patient who has to wear such a combination, therefore, will have to overcome at the near point an

artificial katophobia of nearly 8 degrees, and while he may have an artistic looking pair of spectacles, I am sure he wont have a comfortable pair. But bad as the effect is in myopia, it is infinitely better than is the case in anisometropia. With the vision unequal in the two eyes the prismatic effect of the main glasses will also be unequal. If one eye is hyperopic and the other myopic, the lens before the hyperopic eye will have the effect of a prism base up, and the myopic eye will have to overcome a lens giving the effect of a prism base down, and so an artificial hyperphoria is established varying in degree with the amount of anisometropia. Consider for a moment the effect of this prescription:

R. E. + 1.00 distant correction.

L. E. — 1.00 distant correction, with a presbyopia of 2.50 D.

Referring to the table before given it will be seen that with 8 mm. decentration a 1.00 D. lens is equal to 0.87 degree prism, and that a 2.50 D. lens is equal to 2.16 degree. The right main lens being plus is equivalent to a prism base up, and the left being minus, to a prism base down. The right segment being stronger than the main lens, will more than neutralize its prismatic effect, and the combined action of the two will be a prism 1.29 degrees base down. The left segment will increase the effect of the left main lens, and their combined action is equal to a prism 3.03 degrees base down, leaving at the reading distance a right hyperphoria of 1.74. I think all ophthalmologists will admit that a hyperphoria of $1\frac{3}{4}$ degrees can hardly exist without causing discomfort.

The remedy for this prismatic action caused by decentering the lens is, of course, obvious. We must insist that our opticians make the segment with the optic and geometric centers coincident, even if in some cases the artistic effect is lost. Accuracy is of the most importance and must not be sacrificed for elegance. It will be found necessary in most cases of myopia to grind a prism in the segment and place it with base up. This makes apparently a clumsy looking piece of work. With the first pair I had made in this way, I was afraid that the thick edge of the segment would prove an unsurmountable objection, and be an obstacle to distant vision, but the patient wore them with distinct relief, after becoming discouraged with a pair made in the ordinary way.

CLINICAL NOTES OF OPHTHALMIC CASES SEEN IN
THE HOSPITAL PRACTICE OF DR. CHARLES
A. OLIVER, OF PHILADELPHIA.

COMPILED AND ARRANGED UNDER THE SUPERVISION
OF DR. OLIVER.

BY

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INTRODUCTION.

The following brief histories which form but a minute portion of the routine of the ophthalmic work that I daily see, have, through the kindness of Dr. Posey, been culled from the case books of my individual practice in the two great institutions with which I am connected, and are here embodied under my immediate supervision in every detail into a series of clinical reports that are devoid of note or comment.

The cases selected have been those which have not been deemed sufficiently worthy of individual report or have been repeated frequently often for special generalization. Every case chosen however, has not been subjected to any more than the regular amount of study that is expended upon each applicant who comes for relief. In fact the reports which will be given without any attempt at consecutiveness or logical order throughout a number of successive issues of this Journal and then gathered into a brief monograph upon the subject, are here offered as mere faithful and oftentimes literal reproductions of the clinical methods ordinarily pursued in each special class of subject.

Given in this way, without any attempt at completeness the uninformed student of ophthalmology is presented with a succession of cases that without being too technical or

abstruse, have been sufficiently well studied to render them of value to him when in the future he may be brought personally in contact with such actual work, while the well grounded and thoroughly equipped ophthalmologist who may not be in a position to enjoy the same amount of abundant material, has some of the better and more interesting examples of two of the largest clinical services in the country thus offered him in a friendly way for uncritical and mayhaps instructive perusal.

CHARLES A. OLIVER.

Case I.—Hysterical Amblyopia.—Induced Reversal of Colors in the Visual Fields.—Details of Studies with Tests for the Determination of Binocular Vision.—Recovery.

L. L., an eighteen year old dressmaker, applied to Dr. Oliver's clinic at Wills' Eye Hospital, giving a history of "near sightedness," dating as far back as her memory could carry her. She stated that a maternal aunt was near-sighted, but that no other members of her family had any similar affection.

She had never had her eyes properly examined by a physician, but had obtained glasses from an optician. The first pair had been gotten when she was twelve years of age, they being strengthened every year or so, in order to keep pace with a supposed increase in her myopia. The last pair had been worn for eighteen months' time.

For some time previous to her first visit at the clinic, her health had been failing. She complained of being "run down," associated with a feeling of nervousness and palpitation. About the same time, vision with the left eye had begun to deteriorate, and she had noticed a small yellow spot on the snrface of the eye, rendering her fearful that she might be subject to some serious ocular disease. She had had no headaches. Her menstrual functions were normal, except that at times they would be retarded for several days. She believed that the amount of flow at her last period had been less than usual. No increase of the urinary secretion was complained of.

An examination of the eyes revealed that the pupil of the left eye was four millimeters in size, and that the corresponding iris reacted sluggishly to light and accommo-

dative stimuli. The pupil in the right eye was three millimeters in diameter, and its iris responded promptly to both light and accommodation. A small pinguecula could be seen on the left eye.

Ophthalmoscopic examination showed that the media of the right eye were clear and that its disc was oval, with its long axis situated at fifteen degrees. The scleral ring was continuous about the disc and was bordered by a line of annular pigmentation, which was broadest to the temporal border, but densest to the nasal edge of the nerve-head. The chorioid was everywhere congested. The eyeground could be seen best with a three diopter minus spherical lens. In the left eye, the disc was round and was surrounded by a broadened scleral ring. There was a small conus to the nasal side of the disc and a broader blacker one to the temporal side. The fundus could best be seen with a three diopter minus spherical lens. In each eye the retinal arteries and veins were normal in size and distribution. Uncorrected vision with the right eye was reduced to one tenth of normal ($\frac{5}{50}$), while the accommodative power and range were correspondingly lessened. The vision with the left eye was claimed to be so low that the patient could only see to count fingers directly in front of the eye, at one meter's distance. There was no swelling of the thyroid gland. The radial pulse was seventy-two to the minute.

The reduction in vision with the left eye being out of all proportion to the kind and degree of refractive error, and there not being any discoverable ophthalmoscopic lesion to occasion it, Dr. Oliver thought that the patient was either simulating blindness or was a subject of hysteria. At this primary visit, therefore, he had a series of appropriate tests inaugurated to ascertain more accurately the degree of the visual acuity. A convex spherical lens of ten diopters' strength was placed before the good eye and a convex spherical lens of one quarter of a diopter's strength was held before the left one. The patient was then asked to read the smallest letters on a test card placed at five meters distance, when she immediately responded by reading the fifty diopter type. With the same combination she could readily see to read the half diopter type

at eighteen centimeters distance. These experiments being repeated when a convex spherical lens of eighteen diopters' strength was substituted for the ten-diopter strength lens, she still continued to read the same type at the same distance, thus conclusively showing that the patient's practically uncorrected vision in the left eye was actually as good as that of the other one, it being impossible for her to otherwise obtain any view of the letters upon the distant chart with the good eye when either of the strong convex lenses had been placed before it.

These findings were corroborated by the following plan: A ten degree prism with its base up was placed before the good (the right) eye and a plain red glass was held directly in front of it, in such a way that the right pupil came directly opposite the centres of the two glasses. The patient was then directed to gaze at a candle flame which was held on a level with her eyes at five meters' distance. This done, she at once exclaimed that she saw two candle flames, the red one being situated lower and to the right.

Previous to any of the tests just mentioned, the field of vision of the left eye had been carefully taken. This which was claimed to be reduced to seeing a flame of a candle, was concentrically contracted in area to about fifteen degrees around the fixation point. One hour and a half later, after the completion of the "fogging" and prism tests, the fields of both eyes were carefully restudied.

The fields of vision of the left eye were obtained by the colors employed in the rotation as noted, objects of one centimeter square each being employed. Red gave a concentric contraction to ten degrees, about fixation point; yellow, five degrees; green, ten degrees; white, eight degrees; and blue, eleven degrees. In the fields of the right eye there was also marked concentric contraction for both form a color, though to a less degree and without transposition of the color areas. The form field extended thirty degrees to the temporal side, twenty degrees to the nasal, eighteen degrees upwards, and twenty degrees downwards. The red field fell five degrees within that for form, while the rest of the colors employed occupied their relatively normal positions and extents. A lotion of boracic acid

was ordered to be used locally and a simple tonic pill of quinine was prescribed.

The patient was requested to report periodically for further observation and treatment. She returned in two weeks' time stating that the sight in her left eye had become much improved, this being much more marked when she had the concave lenses for the correction of the compound myopic astigmatism placed before it. Vision with the right eye at this time remained the same as at the first visit, while that of the left eye had apparently increased to the ability to see to count fingers at three meters' distance. With correcting lenses, prisms and various tests, it was found that the vision of the right eye could be improved to one fifth of normal ($\frac{5}{25}$), and that of the left could be brought to almost the same ($\frac{5}{25}$???). Her fields of vision were obtained at once, and showed the following interesting contractions: Those for the right were taken first: The limits for white were concentrically contracted to about eleven degrees around the fixation point. Red was concentrically contracted to eleven degrees; blue to the same degree; yellow, to nine degrees; and green, to seven degrees. Fifteen minutes after those for the right eye had been obtained, a trial was made to get the fields of the left eye. The following order of testing was preserved, showing that yellow was concentrically contracted to eight degrees around the fixation point; green, to five degrees; red, to eight degrees; blue to the same; and white to but six degrees.

Two weeks later the muscle-balance was as follows: At five meters' distance sursumduction equalled three degrees, abduction, six degrees, and adduction but eleven degrees. A study of her visual fields at this time made in a different sequence of examination showed the same concentric contraction and abnormality in the relationship for form and colors as in the preceding tests in both eyes. Her refraction was then most carefully tested and determined to be as follows: O. D.—S. 3. D. \ominus — C. I. D. ax. 180 degrees, giving a vision of one third of normal ($\frac{5}{15}$), and an accommodative power and range of ten to sixty-one centimeters for type of one diopter size; and, O. S.—S. 3. D. \ominus — C. I. D. ax. 180 degrees, giving the same degree

of visual acuity, with an accommodative power and range of ten to fifty-one centimeters for type of one diopter size. This correction was ordered for constant use when immediately the hysterical symptoms abated and have not returned.

Case II.—Foreign Body in the Anterior Portion of the Eyeball for Eight Years' Time.—Spontaneous Extrusion Through Original Point of Entrance in the Corneal Membrane.—Vision Never Interfered With.

T. H. C., a thirty-two year old painter, applied at Dr. Oliver's clinical service at Wills' Eye Hospital with the history that he had been struck in the right eye by a fragment of metal, eight years previously, ineffectual efforts to extract the foreign body having been made by the physician in charge. About one month after the accident he noticed a small brownish elevation inside of the eye on its "dark part," which remained the same until three weeks before he came to the clinic, since which time there had been a sensation of sand in the eye and the eyeball had become red and irritable. As far as he knew the deeply seated brownish elevation had undergone no change.

Examination at the time of the first visit revealed the presence of a dark brown object in the anterior chamber with its forward extremity, which was surrounded by an area of brownish discoloration, protruding from the cornea. The mass corresponded exactly in position and extent to an atrophic area that was situated immediately behind the iris. Intraocular tension in each eye was normal. The pupils were three millimeters each in size and the irides reacted promptly to light-stimulus, accommodation and convergence.

The lens and the vitreous humor of the injured eye were clear. The iris of the same eye was free from all signs of past inflammation except the presence of a couple of loose tags of old posterior synechia situated at the point of the probable former lodgement of the foreign body in the tissue. The eyeground which could be plainly seen, was healthy in appearance, there being a minor degree of hypermetropia and astigmatism, of about the same amount as that in the fellow eye.

Vision in each eye was normal and the accommodative region and play were proper in relation to age and refractive conditions. The visual fields were normal both for form and color.

From the appearance of the eye, it was thought by Dr. Oliver that the foreign body had originally perforated the cornea and had become partially imbedded in the iris tissue or had injured it by contact, as evidenced by the atrophic area in the iris, which corresponded so perfectly with the corneal wound, as well as by the localized tags of posterior synechia, and that it was making efforts to dislodge itself from the interior of the organ through the original wound of entrance in the cornea, in which it had been partly held during its sojourn in the eyeball. With a view of assisting toward the accomplishment of this result, he decided to remove the foreign material, deferring the operation, however, for a couple of weeks' time at the patient's desire and in accordance with his own wish to see the further behavior of the mass during the process of its spontaneous extrusion. The inflammatory reaction was successfully combated by the local use of boracic acid and atropine.

The patient failed to return until a month later, when the cornea about the foreign body was found to have become thickened, hazy and vascular. The eye was accordingly cocainized and Dr. Oliver removed the extruding mass within the grasp of an ordinary iris forceps, this procedure being followed by a slight spurt of aqueous humor. Atropine was instilled and a compress bandage was applied. At the next visit, two days later, the anterior chamber was re-established, the eye was quiet, the pupil was two-thirds and equally dilated at every point save at the broken portion of the iris. An examination of the mass showed it to contain a small fragment of iron.

Vision has never become disturbed and the eye has remained unaltered from normal for nearly six years' time since the little mass was picked out of the corneal tissue.

Case III.—Extensive Burn of Lids from a Piece of Red Hot Metal Weighing Thirty Centigrammes, the Entire Contents of the Eyeball Being Eviscerated by the Traumatism.—Removal of Foreign Substance in Remains of the Eyeball.—Restoration of Eyelids with Thiersch's Grafts.

Less than two hours before being seen by Dr. Oliver at

his clinical service at Wills' Eye Hospital, whilst working at a forge, the patient, a vigorous mechanic of twenty-three years of age, was struck in the left eye by a fragment of hot steel broken off by a hammer in the hands of a fellow workmen, the patient standing at right angles to his companion and the injured eye being situated upon the opposite side. A local physician was immediately called and a mass of metal weighing thirty centigrammes, which more than filled the ocular cavity, was removed from the eyeball. Upon admission to the hospital, it was found that in addition to an extensive burn of both lids, he had suffered a complete evisceration of the contents of the globe by the escharotic action of the metal, the lower outer portion of the bulbar conjunctiva being torn loose from the eyeball. The fellow eye which had a normal vision, was unaffected.

The patient was etherized and the scleral remnants of the eyeball were carefully removed from the orbit without further breakage by Dr. Oliver.

Recovery which was uninterrupted was hastened by thorough cleansing with frequent irrigations of hot sterile water. The socket healed rapidly and cicatrization of the remaining portion of the lids became so far advanced that in a little less than three weeks' time after the accident, it was deemed advisable to undertake their restoration by grafting. The patient was accordingly etherized and after the granulating surfaces of the lids had been smoothed and freshened, three large Thiersch grafts taken from the inner surface of the patient's forearm were engrafted upon the remnants of the lids by Dr. Oliver. A small quantity of iodoform was dusted on the wound, a thin layer of silk protective dressing was spread over the grafts, and an occlusive bandage was carefully applied. The grafts held so well that at the end of ten days' time it was deemed advisable to transplant four fresh ones upon the lower and the inner uncared for margin of the lids. A procedure similar to that just detailed was then adopted with the best results.

Case IV.—Keratomalacia Diabetica, Recurrent in Type.—Sudden Development of Diabetic Cataract.—Death of Patient.

Although the patient, a laborer, forty-two years of age,

had suffered a traumatism in early childhood in the right eye, his eyes had never given him any trouble until three months prior to his being seen at Wills' Eye Hospital. His health had been failing for some years and during the four years prior to his ocular complaint he had been treated by his family physician for diabetes mellitus. When first seen by Dr. Oliver the right eye was seriously inflamed. There was marked tarsal and ciliary congestion and down and out on the cornea there was a dense saturated superficial ulcer, with a corresponding one situated just at the inferior limbus. The iris was discolored and the presence of old synechia showed that this membrane had been involved. Intraocular tension was somewhat diminished. Although uncorrected vision equalled one-fiftieth of normal no view of the fundus could be obtained.

Externally the left eye appeared quiet but the ophthalmoscope revealed that the edges of the disc were hazy and that the retina was somewhat swollen, no hemorrhages or extravasations being visible in the fundus. Hypermetropia in this eye equalled one diopter. Uncorrected vision with the same eye was one fourth of normal ($\frac{5}{20}$), while the accommodative range and power were reduced to ten to twenty-six centimeters for one diopter type.

The visual fields of the right eye which were difficult to obtain were much contracted; that for white extended thirty degrees to the temporal side, and twenty degrees superiorly, nasally and inferiorly, while that for red reached to about fifteen degrees concentrically within that for form. There was a relative scotoma for red, extending slightly up and in from the fixation point. The fields of the left eye were normal both for white and red.

An examination of the urine revealed a specific gravity of 1024. There was no albumen, but sugar was found to exist in large quantities. The patient was placed upon a proper diabetic regimen and a pill of one-thirtieth of a grain of bichloride of mercury was administered three times daily. Atropine and boracic acid were prescribed for local use.

Two days later the iris had given way sufficiently to make the pupil appear ace-of-club shaped, and the upper

ulcer had become less saturated. At the end of two weeks' time the cornea was much clearer and the ciliary injection had become markedly less. In spite of this, however, intraocular tension still continued subnormal. Uncorrected vision with the right eye equalled one-fiftieth of normal. One month later the patient returned to the clinic with a large hypopyon in the affected eye, a ulcer situated upon the upper and outer aspect of the cornea having burrowed its way into the deeper layers of the membrane. There had been no pain. Vision was reduced to the perception of hand movements at a few centimeters' distance before the eyes. The local use of three drops three times daily of a one twelfth of a grain of sulphate of eserine with the internal administration of tri-daily doses of ten drops of tincture of *nux vomica* were ordered. Marked improvement followed this course of treatment, for he returned in a few days' time with the hypopyon gone and the ulcer less saturated. Intraocular tension still continuing much diminished, the eserine was discontinued and the atropine was ordered to be readministered twice daily.

After an absence of four months' time the patient returned, stating that his right eye had troubled him but little, although the sight still remained very weak. He complained that the vision of the left eye had begun to fail about three weeks previously and that there had been considerable pain over the eye, especially at night. His general condition which had been neglected had been so bad that he had been prevented from coming to the hospital.

Careful examination showed that though the right eye appeared comparatively free from irritation, still some tarsal and ciliary congestion existed. The cornea was distorted and was vascular from below. The pupil was irregularly oval and the iris was bound down at a few points to the anterior capsule of the lens by a dense yellow mass of lymph. The anterior chamber was very shallow, this being apparently due to a swelling of the lens substance. The media were so hazy that he could only recognize hand movements with this eye at thirty centimeters' distance.

In the left eye there were the characteristic signs of amaurosis. The cornea was dull and lustreless and there was a small point of ulceration running just below the

pupillary centre in the superficial layers of the membrane. The pupil was oval, four by five millimeters in diameter, with its long axis situated at about eighty degrees. The anterior chamber was deep and intraocular tension was reduced to minus one. Uncorrected vision had fallen to one-fiftieth of normal.

The field of light-perception in the right eye which was obtained by two candle flames showed a concentric contraction to about fifty degrees in all meridians about the fixation point. The field for white in the left eye was concentrically but regularly contracted to the temporal side to about fifty degrees, but on the nasal side it extended to thirty degrees; the field outlines being very jagged.

After a thorough consideration of the case it was deemed advisable to admit the patient to the hospital for closer oversight over his general condition which was of the greatest moment and to study his ocular conditions more carefully, which previously had been rendered impossible upon account of the lowered condition of the vision causing his visits to the hospital to be very difficult. He was accordingly admitted to the wards and placed upon proper food stuffs, while stimulants and digitalis in addition to the nux vomica which he had been taking for the past five months, were employed. Thorough cleansing, with a few trials of dry heat were employed locally to both eyes.

Five days after admission into the hospital the patient awakened in the morning to find that the vision in the left eye had become much worse. Notwithstanding that the epithelium of the cornea was very hazy, it could be seen that the lens had become markedly swollen and diffusely opaque, with numerous broad stria situated in its anterior cortical pushing their way upwards and outwards into the pupillary area, as a narrow zone of about one millimeter's width. The iris was pressed forward rendering the anterior chamber very shallow. The pupil was oval, four by five millimeters in size with its long axis situated at seventy-five degrees. Intraocular tension has become nearly normal. Uncorrected vision had sunk to the ability to see to count fingers at fifty centimeters' distance, while that of the right eye remained about the same as before.

One week later in spite of the most careful hygienic measures and judicious local treatment, a small hypopyon appeared in the anterior chamber of the left eye which was found to be due to the burrowing of a minute corneal ulcer. Notwithstanding this, however, intraocular tension still continued good and vision rose to one-fiftieth of normal. As his general health was better and as he was anxious to go home, he was permitted to absent himself for a few days, being cautioned to continue the treatment as heretofore. In less than a week's time he returned with the eyes in practically the same condition although he stated that he felt exceedingly weak. A few days later at his own wish, he returned to his home and in less than a week he was dead. Unfortunately no post-mortem examination was permitted and in consequence no anatomical studies could be obtained.

Case V.—Exophthalmic Goitre.—Extreme Exophthalmos and Sloughing of Both Cornea not Controlled by Extensive and Repeated Tarsorrhaphies.—Thyroid Extract Administered in High Doses Without Avail.

The patient, a twenty-seven year old married woman, came to Dr. Oliver's clinical service at Wills' Eye Hospital. She gave the following history: About six months previously, without any assignable cause, she had noticed that she was nervous and irritable, and that the collars of her dresses were becoming too tight and uncomfortable. She also suffered greatly from diarrhea, this being very persistent and seemingly beyond the control of medication. She complained of colicky pains and nausea, these often being attended by vomiting. Her menstruation which had been regular up to four months previously, had occurred but once since that time. She was happily married with two healthy children and lived in a healthy suburb of Philadelphia, not being called upon to make any more violent efforts than those incident to managing her ordinary household affairs.

After the nervousness the swelling in the neck and the diarrhea had persisted some time, her attention was called to the fact that she had a curious staring expression and that "more of the whites of the eyes showed than was

usual." Lacrymation was increased. The protrusion of the globes slowly continued until it became so great, that she was unable to close her lids over the protruding eyeballs; for this symptom she decided to seek relief at the hospital.

Upon admission both eyes were found to be greatly protruded in the median line, four millimeters of the sclera between the upper corneal limbus and the lower border of the upper lid being exposed when the patient looked straight ahead. When the patient was requested to close her eyes as tightly as possible, the eyeballs were so prominent that the palpebral fissure of the right side was only reduced to an opening of four millimeters' width while that of the left became but one millimeter narrower.

Her ocular movements were fair, the eyeballs being slightly restricted in all meridians, this being more especially marked in upward motion. The corneæ were clear. The eyes were quiet and did not exhibit any gross evidence of trophic or inflammatory change. The pupils were two and a half millimeters in diameter and the irides responded equally and freely to light-stimulus and accommodative and convergence impulses.

The thyroid gland was markedly enlarged, especially on the right side, and a distinct thrill was imparted to the palpating hand over all parts of the gland. A mitral murmur could be distinctly heard at the base of the heart. The radial pulse equalled one hundred and twenty-eight.

Uncorrected vision with the right eye equalled one-third of normal ($\frac{5}{15}$), while that of the left eye was but one fourth ($\frac{5}{20}$). The accommodative power and range in the right eye was found to be type 0.75 D. twenty-four to forty-five centimeters; that of the left eye being twenty-one to the same far point. Extra-ocular muscle balance at five meters' distance showed an esophoria of two degrees and a right hyperphoria of the same amount. At thirty-five centimeters there was an exophoria and a right hyperphoria of one degree each. The visual fields for white, red, and green, showed a concentric contraction of thirty degrees to the temporal side and fifteen degrees to the nasal side, while the upper and lower limits were reduced to five degrees each.

An ophthalmoscopic examination revealed the following condition: In the right eye the media were clear, the disc was oval, with its long axis at seventy degrees, its substance being of good tint. The retinal veins were slightly tortuous, but no vascular pulse could be detected. Retinal striation was quite marked. There were two diopters of hypermetropia. The media of the left eye were clear. The disc was oval, with its long axis at one hundred degrees. The retinal vessels and striation presented the same appearance as that in the fellow eye. Hypermetropia equalled one and a half diopters.

It was deemed advisable to admit the patient into the wards of the hospital for absolute rest in bed. This advice being acceded to, she was placed in bed, ordered a strict milk diet and given ten grains of bromide of sodium three times daily. An occlusive dressing was applied to both eyes at night, and the conjunctival sacs were kept flushed three or four times a day with warmed boracic acid solution.

At the end of four days' time the pulse had fallen to eighty-six, the patient was resting quietly, and the exophthalmos did not seem to be so great. Upon consultation Dr. Oliver having gone away on his summer vacation, the bromide was increased to thirty grains three times daily. The patient continued to do well until one week later, when the conjunctiva of the right eye became injected and chemosed, and the exophthalmos seemed greater. The cornea of the same eye was still clear. A compress bandage was applied constantly and rigid antisepsis in the dressings was insisted upon. Notwithstanding these precautions, the lower half of the cornea became very hazy at the end of a few days, and a slight chemosis appeared on the inferior portion of the bulbar conjunctiva of the left eye.

As the general condition of the patient seemed to be failing, strychnia in one-thirtieth of a grain doses three times daily were substituted in place of all other general treatment. In addition, she was given a more liberal diet. Tarsorrhaphy in both eyes was decided upon, this being done during the absence of Dr. Oliver by Dr. Posey. The edges of the lids just within the border of the cilia were freshened to the extent of about four millimeters. Three

sutures were inserted deeply into the structures of the lid and tied over a roll of adhesive plaster, that they might not give way under the great strain placed upon them. Notwithstanding this procedure, the stitches in the right eye broke loose at the end of several days' time, the patient, however, stating that her eyes felt very much more comfortable after the operation. Complaints were now made of vertical headaches. Tri-daily doses of five grains of thyroid extract were ordered.

A week later, as the stitches in the left eye showed signs of breaking loose, it was decided to repeat the operation. By this time the cornea of the right eye had become necrotic. The upper and the lower portions of the left cornea were still clear, a zone of dense opacity being stretched across its middle third. The operation was repeated, and a mixture of sweet oil and boracic acid in hot stupes was applied. The thyroid extract in the same dosage was increased to five times daily. At the end of a week's time the condition was no better, and as the stitches had given way under the pressure to which they had been subjected, they were removed and the dressing continued.

The patient was kept in the hospital a month longer, and as her general condition had improved sufficiently to permit of her traveling, and as it was thought that country air might be more beneficial than the extreme heat prevailing at the time in the city, it was decided to permit her to go home. A final inspection was made of her eyes, revealing the following condition: There was still marked right exophthalmos. The cornea of the same side was quite opaque, a large necrotic area still occupying its center, while several cysts were forming to the upper nasal border, these being apparently due to an extreme thinning of the membrane. Considerable ciliary injection with some lachrymation persisted. The exophthalmos in the left eye was not so marked, but the corneal tissue was much thinned and several cysts could be seen projecting from it. The swelling of the neck was not so pronounced and the vascular thrill was less distinct.

After a month's absence she returned with the statement that she felt much stronger and that her eyes did not

trouble her so much. Examination at this time, however, showed them to be in practically the same condition as when she was last seen. At this juncture the case was lost sight of.

Case VI.—Panophthalmitis and Orbital Cellulitis with Pronounced Pyrexia.—Enucleation During Active Stage of Inflammation with Immediate Return of Temperature to Normal.—Uninterrupted Recovery.

P. N., a laborer, sought relief at Dr. Oliver's clinic at Wills' Eye Hospital on account of his left eye. He stated that the eye had been scalded with boiling water twenty years previously leaving a "white spot" upon it, and that vision with the affected eye had been very poor since. For eight days or more before first being seen the eye had troubled him greatly, having become red, watery and painful. He denied any gonorrheal infection, nor was he aware of his eye having been subjected to contagion from any other source.

Upon admission, the lids of the left eye were found to be enormously swollen and both the bulbar and the tarsal conjunctivæ were thickened and exuding a copious purulent discharge. There was marked proptosis. The movements of the eyeball were restricted in all directions, especially in the horizontal meridian. The cornea was hazy and there was a large irregularly edged slough occupying its upper and outer quadrant. The eye was blind.

The right eye was quiet and beyond a hypermetropic astigmatism of about two diopters there was no change in the fundus. Vision with the right eye equalled $.5/7\frac{1}{2}$; and the accommodative power and range equalled type 0.50 D. from eight to sixty centimeters.

A diagnosis of orbital cellulitis being made, the patient was placed in bed in the hospital. Iced compresses were applied over the eye and blood was extracted from the temple. Boric acid and atropine were instilled at proper intervals and ten grains of blue mass were administered upon the night of his admission. These tentative procedures were adopted upon account of the marked degree of general febrile disturbance that was present.

To be continued.

A CASE OF PROBABLE REMNANTS OF THE SHEATH OF THE HYALOID ARTERY.*

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ILLUSTRATED.

The anamoly was seen in the left eye of a boy twelve years of age. There was a pyriform white connective-tissue mass springing from the porus opticus and extending in front of the retina forward, upward and toward the macular region. It was about one and a half discs diameter in length and three-fourths in width. Projecting from the lower part of the anterior surface there was a



conical mass of similar appearance. The anterior edge of this, as well as the macular border of the body-mass, was fimbriated. Two streamers came forward into the vitreous, one toward the posterior pole of the lens, the other toward the temporal side; the former terminating in a lace-like opacity; the latter in an oval opacity. Near the upper border of the growth there was a spindle shaped area having much the appearance of choroidal tissue and suggesting a rent in the membrane; but this it could not

*Read before the Section on Ophthalmology, College of Physicians of Philadelphia.

be as its surface was focused with about $+4D$, whereas the fundus level was from $+1-1.5D$. The general level of the mass was at about $4D$. The vitreous opacities were seen with a $13D$. The superior temporal vein passed behind the mass at a point corresponding to the position of the red spindle shaped spot upon the surface. That even the edge was in advance of the plane of the retina was shown by the marked parallax obtained. The eye was amblyopic, the patient being only able to see to count fingers at one meter's distance. The right eye presented no anomaly.

GROWTH OF CILIUM BENEATH THE SKIN OF THE LID.

BY GEORGE M. GOULD, M. D.

OF PHILADELPHIA, PA.

In the *Medical News* of June 27, 1891, I described a condition which I named *Superciliary Entropion*,—the incurvation of eye-brow hairs (often of excessive growth in old people) between the palpebral aperture and causing conjunctivitis. One of these cases was noteworthy from the fact that the conjunctivitis thus induced was in a socket from which the eye-ball had been removed.

The present memorandum is to describe another curiosity and abnormality of the hair of the eye which I have never seen described in any writing, and which several oculist friends have never seen. A patient complained of quivering of the lid of one eye and of a tiny tumor near the margin. Accurate observation showed that a cilium was growing beneath the skin of the upper lid, turned back upon itself and dissecting up the skin a little and giving the appearance of a small bleb about 2 mm. wide, 3 mm. high, and 4 mm. long. The lash could be plainly seen beneath the skin, raising the latter by the elastic power of the hair abnormally curved upon itself.

METAMORPHOPSIA.

By DAVID KLETZKY,

OF PUEBLO, COLORADO.

What is the cause of metamorphopsia?

The phenomenon of metamorphopsia, manifested immediately after the correction of oblique astigmatism with proper cylindrical lenses, is known to be of short duration. By reviewing the different theories of metamorphopsia, I find one regarding the cause of its manifestation, and the cause of its disappearance, advanced by Dr. G. C. Savage in his valuable work, "New Truths in Ophthalmology," Third Edition, page 41. Relative to the functions of the oblique muscles he states the following: "The complicated function of the oblique muscles exists only in cases of oblique astigmatism with meridians of greatest curvature converging or diverging above, and in unequal degrees of oblique astigmatism when the meridians of greatest curvature are parallel." By "complicated functions of the oblique muscles" in cases of oblique astigmatism is meant that the function of these muscles is to rotate the eyeball on their antero-posterior axes, "that they may bring harmonizing parts of the two retina under dissimilar images, and thus insure binocular single vision."

In the next few sentences Savage proceeds thus: "The necessity for this function is entirely destroyed when the astigmatism is properly corrected; but the action of the obliques does not always cease at once in binocular single vision through the correcting cylinders. The old habit of rotation often continues for hours, and sometimes for days, although there is no longer need for it, and the result is metamorphopsia." These quotations declare that the metamorphopsia is due to the old habit of rotation of the eyes on their anterior-posterior axes—a statement unsupportable by the facts. A more reasonable inference is that a rotation of the axes of the principal meridians of the astigmatic eyes in front of the axes of the correcting

cylinders not only causes metamorphopsia, but, at the same time, brings about a diminution of the acuteness of vision.

In this assumption, the latter must be associated with the former. A simple experiment will prove my assertion. Take two cylindrical lenses, one+ and one —. of equal refractive power, (say 2.50D), and place both cylinders axis to axis; by so doing one neutralizes their refractive power. This is what happens to an astigmatic eye when the proper cylinder is placed in front of it. By rotating the two cylinders mentioned, so that their axes assume an arc of 10° *, and by holding this combination in front of and close to your eye, you will observe by looking through these crossed cylinders that not only metamorphopsia would result, but the result would also be manifested by a marked diminution of the acuteness of vision. By comparing the rotation of the axes of the two cylinders mentioned with the rotation of a pair of oblique astigmatic eyes in front of the properly correcting cylinders, I would assume that the rotation of the eyes on their antero-posterior axes in front of the correcting cylinders would be manifested by the same result that was observed in the experiment, viz.: metamorphopsia accompanied by a corresponding degree of diminution of acuteness of vision. A knowledge of the fact that in cases of corrected oblique astigmatism metamorphopsia takes place without diminution of the patient's acuteness of vision, and that vision in cases of this nature is always better when binocular than uniocular shows us that the old habit of rotation of the eyes on their antero-posterior axes is relinquished at once after the correction of the oblique astigmatism with the proper cylindrical lenses. For this reason, the theory advanced, that metamorphopsia is due to a rotation of

*By making the axes of the two cylinders assume an arc of 10° the resultant refraction of the two cylinders is equal to two crossed cylinders of lower refractive power, with axes at right angles,—a point which has been demonstrated by different authors. It is necessary by this experiment to hold the cylinders in front of the eye in such a position that the bisecting imaginary line of the arc of the axes of the cylinders coincides with the vertical meridian of the cornea. If held otherwise, say at an angle of 45° from the vertical, then the axes of the resultant cylinders are at 90° and 180° . Through this position of the axes a diminution of the acuteness of vision will result, without metamorphopsia.

the eyes on their antero-posterior axes in front of the correcting cylindrical lenses, cannot be accepted.

A more acceptable theory regarding the cause of metamorphopsia can be advanced by taking into consideration the principal part played by the nodal point in the correction of ametropia of curvature. Since an astigmatic error is simply a defect of curvature, then the correction of such defect by a proper cylindrical lens must naturally affect the position of the nodal point of that eye at right angles to the axis of the correcting cylinder. The correction of hyperopic astigmatism brings the nodal point forward, and a correction of myopic astigmatism pushes it back from the cornea; consequently in hyperopic astigmatism objects appear to be spread out in the direction of the meridian parallel to the curvature of the correcting cylinder, and in myopic astigmatism they appear spread out in the direction of the meridian *parallel to the axis* of the correcting cylinder.

The above makes it conclusive that the disappearance of the metamorphopsia by wearing the correcting cylinders is a psychological phenomenon.

26 Mechanics Building.

AN UNUSUAL FORM OF HYPERTROPHY OF THE LIDS.

By F. G. MURPHY, M. D.

MASON CITY, IOWA.

ILLUSTRATED.

Nicholas Attwooll, laborer, aged 58, unmarried, born at Portland, England, has had hypertrophy of the lids of the right eye since he was three months old. His older sister informed me that the lobe



Fig. 1.

of the left ear has been enlarged since she can remember, but does not recollect noticing it when he was a baby. She also said that when the patient was three months old he had had inflamed eyes, that a "white scum" formed on each eye, and that the doctor applied three leeches to each upper lid. Since that time, the lids of

the right eye have been in the condition they now are. The hypertrophy of both lids of the right eye and the left lobule have slightly increased with age.

The lids of the right eye protrude much further than they seem to in the photograph, especially when he is looking with the left eye. The swelling of the lids seems to be of the same character as that of the lobule. The swelling is not a true tumor affecting the dermal tissue, but is a uniform thickening of the whole skin.

The hypertrophied tissue is very loose and flabby, and somewhat darker than the skin on other parts of the face and neck. The skin



Fig..2.

for about an inch around the left ear is of the same loose character as that of the lobule, and allows the whole ear to be pulled about two inches in any direction, and explains the fact that the ear is displaced (by its own weight) downward about three-quarters of an inch from its normal position.

It is necessary to raise the auricle nearly an inch in order to introduce a speculum into the external auditory canal. His hearing in both ears is about normal.

His vision in the left eye is $\frac{10}{200}$, in the right eye $\frac{15}{200}$; not improved with glasses. He uses his left eye altogether, as in Fig. 1, except when he wishes the best possible vision, as, for instance, when

he meets a stranger, when he desires to read, etc. On such occasions he uses the right eye, as in Fig. 2. While his vision is better in the right eye, it is quite an effort to raise the large cumbersome lid very long at a time. With the right eye he is able to read Jaeger No. 4 at 4 inches, and with the left eye, No. 8 at four inches.

Vision for reading not improved with glasses.

He has marked strabismus deorsum, which is quite conspicuous when he is using the right eye. This condition has also increased considerably as he has grown older. His relatives assert that when he was a young man, the hypertropia was not nearly so marked.

The tissues of the nose and throat are normal. There are no growths or nodes or any other thickening of the skin elsewhere on the body.

No similar condition exists in any member of his family.

THE DIPLO-BACILLUS OF SUBACUTE CATARRHAL CONJUNCTIVITIS.

BY H. GIFFORD, M. D.

OMAHA, NEB.

ILLUSTRATED.

This germ was first reported by Morax (*Annales de l'Inst. Pasteur*, Juillet, 1896, p. 337), as a frequent cause, in Paris, of subacute and, more strictly speaking, of chronic conjunctivitis. The disease which it caused was in general very insidious in character, frequently beginning so gradually that the patient could not tell when it really began; and running a course of from six weeks to six months, during which the main symptoms were a slight redness and hyper-secretion of the conjunctiva and very moderate subjective symptoms. Often, in fact, the only thing which brought the patient to the doctor was the persistence of a slight agglutination of the lids in the early morning. The germ commonly occurs in the form of a diplo-bacillus, each member of which measures 2-3 mm. in length by 1.5 mm. in breadth. Chains of these diplo-bacilli are not infrequent and, in cultures, forms sometimes as long as three or four of the single bacilli with no apparent sign of division occur, also forms which take up the coloring irregularly. Spores have not been observed. In the discharge it occurs frequently in enormous numbers; generally free but also at times in leucocytes or adherent to the surface of large epithelial cells. It takes most stains readily but is decolorized by Gram's method. It grows upon blood serum, but not upon agar-agar unless blood serum or ascitic or ovarian cyst fluid has been mixed with it or spread on the surface. Neither does it grow upon gelatin, potatoes, milk, or bouillon. In bouillon mixed with one-third of blood serum it grows well. With pure cultures Morax was able to reproduce the disease in man.

A short time after the appearance of this paper by

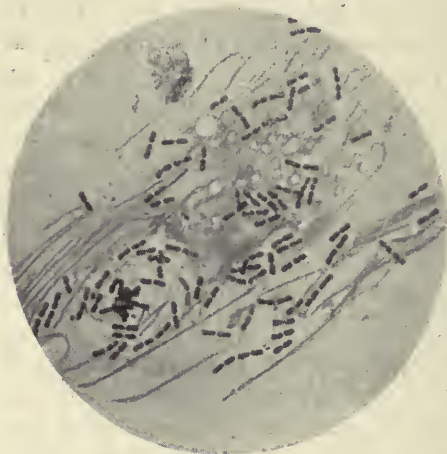
Morax, Axenfeld, from observations made entirely independently, described the germ at the 1896 meeting at Heidelberg: also in a later and fuller paper in the *Centralblatt f. Bacteriologie*, XXI, 1. His observations coincide almost entirely with those of Morax, both as to the characteristics of the germ and the clinical picture of the disease which it causes. He mentions the fact that its growth on coagulated serum is exceedingly characteristic, inasmuch as the germ in growing, gradually liquifies the medium (later this was also observed by Morax), also that it is strictly aerobic and very sensitive to any acidity of the cultivating medium. In one case he found the bacilli in a corneal phlyctenule. The clinical picture, in most of his cases, was that of a slight blepharo-conjunctivitis with hyperemia of the conjunctiva, particularly at the inner corner. He insists upon the slight tendency to spontaneous cure and prefers to designate the affection as a chronic, rather than a subacute conjunctivitis. He, too, obtained positive results in two cases in which the human conjunctival sac was inoculated with it. Since then I know of only three publications on the subject;* one of these by Peters (*Klin. Monatsblätter f. Augenheilkunde*, June, 1897,) who found the germ in eighty cases. His conclusions agree in the main with those of Morax and Axenfeld, with the exception that in all of the four cases in which he made cultures, the germ grew upon glycerine-agar, although sparingly. (Axenfeld obtained an agar culture in one case only). He lays more stress than his predecessors upon the complications of the disease. In four cases in which the bacillus was found, there was marked folliculosis of the lower retro-tarsal folds, probably a mere coincidence. The germ was also found in one case of slight traumatic ulcer; in two cases of keratitis vesiculosa; in several cases of phlyctenular trouble; in some cases of atrophic trachoma and in one case where there was ectropium of the lower lid.

In France Augi  ras (*Recueil d'Ophthalmologie*, July, 1897, p. 369,) has found in seventeen cases of catarrhal conjunctivitis a diplo-bacillus which is, in all probability,

*Since this has gone to print Prieuzeau (*Annales d'Oculistique*, Fev., '98,) has reported finding the germ in seven cases of chalazion, other germs also being present.

the same as that of Morax. He does not appear to have cultivated it.

In a third communication (*Berlin Klin. Wochenschrift*, 39, 1897,) Axenfeld states that he has been compelled to modify his previously expressed opinion that the diplo-bacillus always causes a chronic affection with an insidious onset; for he has since had cases in which the beginning of the inflammation was stormy, with marked swelling of the lids and redness of the conjunctiva. He also mentions one case in which the bacillus apparently caused a severe corneal ulcer, requiring the galvano-cautery to check its progress. Other complications which he has



Diplo-bacillus of Morax and Axenfeld in discharge from subacute catarrh of conjunctiva.

seen the germ connected with were phlyctenular keratitis, and, in the case of one old woman who had had conjunctival catarrh as long as she could remember, distichiasis of all four lids. In phlyctenular keratitis he considers it either a coincidence or perhaps, in some cases, an indirect cause by producing conditions which favor the action of the direct cause of the phlyctenules, whatever that may be. He has found the germ hitherto in fifty-one cases; the youngest patient was a child of 1 year; the others were of all ages.

With regard to therapeutics, Morax, Axenfeld and Peters, all praise the effects of zinc sulphate. Morax recommends it in the strength of $2\frac{1}{2}$ per cent., Axenfeld

in $\frac{1}{2}$ per cent., while Peters prefers his zinc-ichthyol paste.

I first saw this germ in the summer of 1892, in the secretion from the conjunctiva of a girl of 11, who for several years had had more or less inflamed eyes throughout the summer. The lower folds and tarsi were quite rough, almost trachomatous looking, while the upper tarsus, though smooth, had the milky or waxy appearance characteristic of vernal catarrh; circum-corneal hypertrophy, however, was absent. The discharge was moderate, somewhat watery, with flakes of muco-pus in which, with the microscope, myriads of the germs shown in the accompanying plate were to be seen.* Within a year or two of this time I saw the germ in three other cases; one of these was a middle aged woman with long standing catarrh of the conjunctiva, the rather profuse muco-purulent discharge containing immense quantities of the diplo-bacillus; another was a young woman with an acute but rather mild catarrhal conjunctivitis, which ran a somewhat prolonged course; while the fourth patient was a child with an exacerbation of phlyctenular conjunctivitis. I have no notes of any attempts to cultivate the germ from these cases; if I made any it was not surprising that they failed, as I was not using serum at that time. I did not see the germ again until September 1, 1897, since which date I have seen it in four cases. In one of those, that of a young woman, a slight conjunctivitis had dragged along for three weeks, the conjunctiva of the lids was slightly hyperemic and the scanty discharge showed the characteristic diplo-bacilli in large numbers. Another, a young girl, presented an acute conjunctivitis with the membrane so red and rough that I suspected acute trachoma. The microscope showed the diplo-bacillus in the discharge in rather sparing numbers, and the event proved the inflammation to be non-trachomatous. The third case was remarkable in so far as it was one sided and the conjunctivitis, of a week's standing with only moderate swelling of the membrane, was complicated by a small corneal ulcer, slightly up and in from the center, evidently of a very virulent character, for the irritation was extreme and a small hypopyon was present.

*This micro-photograph was kindly made for me by Dr. Wm. Gray, of Washington; the magnification is 1,000 diameters.

The evidences of progress were so marked and it was so near the center that I thought best to use the small Paquelin cautery at once, after which it healed slowly. A scraping from the ulcer showed an abundance of diplo-bacilli with an unusual number of very thick forms, a few of which seemed like large staphylococci.* The fourth patient was a girl of 16 who, some weeks before, had had an acute attack of conjunctivitis from which the right eye had nearly recovered but which still persisted in the left. There was moderate hyperemia both of the tarsal and bulbar conjunctiva with some bulbar petechiæ, and at the outer side of the cornea an elevation which looked like a large subconjunctival phlyctenule. The discharge was scanty. No cover glass preparations were made of it, but the single flake obtained was used to spread out upon a slant of coagulated serum. On this there grew a few colonies of the xerosis bacillus and several of the diplo-bacillus of Morax. The colonies were almost colorless and sank down and fluidified the serum as fast as they grew, leaving the surface dotted with little pits in the bottom of which a greyish or slightly yellowish grey sediment could be detected. This proved it to be a pure culture of the diplo-bacillus.† I have not been able to grow this germ upon any preparation of agar, gelatin, potato or bouillon; neither have I succeeded in growing it on serum at room temperature; but at a temperature of from 94° to 98° Fahr., it grows readily upon pig-serum and serum-agar; the serum being liquified all along the line of growth, which broadens, if the tube is kept in the oven, until in some cases, the whole surface of the slant is broken down. My cultures have died out in from ten to fourteen days. An attempt to make an anaerobic serum culture by Buchner's method was unsuccessful. With regard to the morphological characteristics of the germ, my observations coincide, except in one particular, with those of Morax,

*This tendency to produce unusually thick and rounded forms I have recently seen in the serum cultures from another characteristic case.

†Since writing this I have seen two additional cases of conjunctivitis from which I have obtained the diplo-bacillus both in cover glass specimens and in serum cultures. In one of these the resemblance of the conditions to subacute trachoma was so marked that I should have made an incorrect diagnosis, if I had not examined the discharge.

Axenfeld, and Peters. In the secretions the germ, while showing some individual variation in size, is on the whole quite uniform. The large thick double rod is the almost invariable form, each member of the pair frequently showing an indistinct subdivision at its middle. In cultures there is more variety in the forms to be seen. In fact, until one has made repeated examinations from single colonies of plate cultures it is difficult to believe that a pure culture is such. The rods vary considerably in size, coccus-like individuals are seen and occasionally long, somewhat misshapen rods, such as are figured by Morax as involution forms, are found; also, in the same case, long chains superficially resembling streptococci. The germ stains very readily, dilute carbol-fuchsin giving the best pictures, in my experience. It is decolorized by Gram's method.

Morax, Axenfeld and Peters state distinctly that this germ has no capsule. From this I must differ to some extent. In most preparations of the exudate no capsule can be made out upon most of the bacilli; but in others, as in that from which the accompanying photograph is taken, the capsule is very distinct around nearly all of the double rods, and on the whole, comes out more plainly in the photographs than when the specimen itself is looked at. The capsule is not so broad as that frequently seen around the pneumococcus, but it certainly is present in a number all of my specimens. Augieras says that the bacillus seems to be sometimes surrounded by a clear space; and in the wood cut accompanying Axenfeld's latest article, signs of a capsule are distinctly shown around some of the bacilli. Also in photographs kindly given me by Dr. Alt of St. Louis, made from specimens obtained in his clinic, the capsule comes out very plainly. Dr. Alt had made no culture of the germ and from its appearance supposed it to be the bacillus of Friedländer; and since I have made cultures from only four of my cases, it may be objected that the germ found in the others was really not the diplo-bacillus of Morax; but the pictures were so characteristic and corresponded so exactly with those of Morax and Axenfeld in other respects, that I have no doubt about the identity of the germ and think the contradiction with regard to the capsule may be explained by some difference in the method

of preparing the specimens. I prepared mine by spreading the discharge very thinly on the cover-glass with a wire, and have stained with carbol fuchsin diluted on the cover-glass with two or three times its bulk of water, warming it for about two minutes.

With regard to the specificity of the bacillus, although both Morax and Axenfeld had obtained positive results from inoculations of pure cultures on the human conjunctiva, I thought best, to be sure that I had the same germ, to try it on myself; and as the simple statement that as one has had a positive result may mean so little, I will, at the risk of being tedious, give the experiment somewhat in detail.

On the evening of February 4, 1898, I put into my right conjunctival sac a bit, the size of a pin head, from a serum culture of the third generation. Toward the latter part of the evening the eye felt a little painful and irritated, but on the next day, and for the greater part of the 6th, the eye appeared normal. During the evening of the 6th, however, while at work, the eye began to feel decidedly irritated and hypersecretion was quite pronounced. The next morning the lids were stuck together and there was quite a collection of pus at the inner canthus. For the next two weeks the conditions remained about the same; during the days the eye would feel practically normal although the conjunctiva was decidedly hyperemic, but in the evenings after a little close work, the eye would begin to feel irritated and the vision somewhat blurred. These symptoms would increase very gradually until bedtime, the lids always being stuck together in the early morning, the discharge showing an abundance of the diplo-bacilli. Serum cultures showed numerous colonies of them with a few of the xerosis bacilli and the white pus cocci. Up to this time, I had been careful to avoid infection of the eye, but now I purposely washed both eyes in the same basinful of water and was rewarded after a few days by the appearance of a similar inflammation of the left eye, the discharge showing the diplo-bacilli in cover-glass specimens and in serum cultures. A single application of a collyrium of zinc chloride (1 gr. to the ounce) gave prompt relief, but the symptoms returned after sev-

eral days and four or five applications were necessary to rid my conjunctival sacs of the germ.

From what has been said, it is evident that the appearance of the eyes infected with this germ is anything but uniform, but it can certainly be said that in the great majority of cases, the symptoms are subacute or chronic in character. I have found them to yield quickly to the one-fifth per cent. solution of zinc chloride dropped into the eyes, or in rare obstinate cases, upon the everted lids. From my own experience, and that of Axenfeld, the most important characteristic of this germ is its power of producing serious corneal ulcers.* The cases of Morax and Peters seem not to have been serious, and a corneal ulcer in which Dr. Holden of New York has recently found the germ,† with the microscope, was not markedly virulent; but I have never seen an ulcer start out with greater virulence than in the case which I have mentioned above, and in Axenfeld's case, also, the ulcer gave every evidence of decided malignancy. Since I have found the zinc chloride to have as marked an influence upon the pneumococcus as upon the diplo-bacillus, it seems to me that its use (the sulphate may perhaps do as well) as an application to the conjunctiva is decidedly advisable in all cases of corneal ulcer. Even in cases where the presence of trachoma demands severe treatment, I have the zinc solution dropped upon the lids night and morning.

This germ seems to be of a decidedly cosmopolitan character; it has been reported from several localities of Germany and Austria, and from two localities in France. In this country, although no one but myself seems to have cultivated it, it has also been observed in St. Louis and New York. The probable reason for its having attracted so little attention is that the discharge which it produces is generally so slight that it offers no great temptation to the bacteriologist to investigate it.

*The fact that it may produce conditions closely resembling moderate trachoma should also be remembered.

† Verbal communication.

A CASE OF PERSISTENT HYALOID ARTERY CONTAINING BLOOD.

BY F. W. MARLOW, M. D.,

SYRACUSE, N. Y.

ILLUSTRATED.

Miss L. W., aged 16 years, sought advice on account of asthenopic symptoms on May 21st, 1893.

The ophthalmoscope revealed the following conditions in the left eye:

A vessel coming from near the center of the papilla, around the inner side of the bifurcation of the central artery, at first sight appearing as though emerging from the bifurcation itself, passes almost straight forward to the posterior pole of the crystalline lens, where it is attached by means of a round, flattened disc, the diameter of which is three or four times as great as that of the vessel itself.

Very marked pulsation is seen in the vessel, which causes a rhythmical wavy motion in its whole length, synchronous with the pulse at the wrist, and, I think, rhythmical distension of the posterior half.

The posterior portion of the vessel is inclosed in a translucent sheath of tissue of conical form, with base at the optic disc, its anterior extremity terminating abruptly, and leaving the vessel (*apparently* the blood column only) unsupported in the fluid vitreous. The sharply defined anterior extremity of the sheath can be seen with a +10D or +12D lens behind the ophthalmoscopic mirror.

There is a suggestion of a similar sheath passing back from the lens capsule, and abruptly terminating in the same manner, but it is not nearly as definite as the posterior sheath.

The vessel is very uniform in outline, and somewhat darker in color than the retinal vessels, but this may be accounted for by the fact that the blood column is looked at endwise, and is also contrasted with the bright reflection.

from the choroid. It looks a little larger in the posterior sheath than it does after it emerges from it, presumably on account of the refraction by the translucent tissue.

The vessel ends in a small circular plate at the posterior pole of the lens, or a little above it, and from the outer side of this plate a vessel, perfectly straight, runs in an outward and slightly upward direction toward the equator of the lens. What becomes of it cannot be determined, even with a fully dilated pupil. This branch is uniform in caliber, and perfectly sharply defined, and appears of the same color as the hyaloid artery by reflected and transmitted light.

There can also be seen by the ophthalmoscopic direct method and a +26D lens, very numerous vessels (?) radiating from the round plate, very fine, and to be traced



Diagrammatic enlarged representation of lenticular plate and vessel. only a very short distance away. They tend to be straight, and possibly branch, but are so fine that it cannot be positively determined whether branching or anastomosis takes place.

Down and in from the point of attachment to the lens, and on its posterior surface, is a small pigmented area, across which some fine striae can be seen, suggesting the original attachment of a branch of the main artery, but there is no trace in the vitreous of any such vessel.

Javal ophthalmometer shows 2D of corneal astigmatism, with +2D sph and +1.5D cyl. ax. $.90^\circ$ $V = \frac{6}{36}$; macular region normal.

The right eye shows no abnormality, with the exception of a low degree of hypermetropia and astigmatism.

In DeBeck's very valuable monograph on the "Persistent Remains of the Fetal Hyaloid Artery," there are re-

ports of two cases which are of interest in connection with this one. The first is that of Manz (142), who describes in an anencephalus fetus a conical process occupying the optic disc, composed of a blood vessel surrounded by a cellular envelope, a drawing of which is given in Fig. 3, plate 1, of the above-mentioned work.

The drawing in its general effect, especially as regards the abrupt termination of the case, represents very well the appearance of the posterior sheath described in the present case. The other case is that of Gardiner (148), which is accompanied by a cut.

In relation to this, DeBeck says:

"This cut is the only one I know illustrating the post-capsular vessels remaining in the living subject. They are shown very tortuous, and almost as if they anastomose. How much of this is due to the artist and engraver I can't say. In Kölliker's injection of the fetal eye these vessels pass almost straight from the pole to the periphery, and in my cases this condition is very clearly shown."

In the case now reported, also, the straightness of the post-capsular vessels is one of its most marked characteristics.

THE PHYSIOLOGIC AND THE PATHOLOGIC PUPIL.*

A REVIEW.

BY FRANK C. TODD, M. D.

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The iris is a highly organized structure composed of muscular fibres, epithelium, connective tissue, pigment, blood vessels, lymphatics and nerves. It surrounds an opening called the pupil, which varies in size under certain physiologic and pathologic conditions. These variations are valuable aids in the diagnosis of some diseases and in the location of cerebral and spinal lesions, as well as guides in the administration of drugs and in the determination of ocular disorders.

In connection with the description of these various diseases, changes which take place in the pupil are noted in the text books, and the importance of these changes is well recognized, but rarely do we find the reason for them in the descriptions, and it, therefore, would seem that a consideration of the pupil from a physiologic and pathologic standpoint might be of interest, and perhaps lead to a better understanding of its diagnostic significance.

The diameter of the physiologic pupil when the visual axes of the eyes are parallel, *i. e.*, when there is no convergence of the two eyes, ranges from 2.5 to 5.8 mm. The pupils of people with light irides are, as a rule, smaller than those with dark, for more light reaches the retina. and hence the pupil reflex is stronger. At birth the pupils are small, increasing in size as the child grows older and as age advances, and the walls of the vessels of the iris become sclerosed with consequent rigidity of its structure, together with a decrease in the energy of the sympathetic, the pupils again become small. In neurasthenics and in

*Read before the Minnesota Academy of Medicine, April 6, 1898.

excitable people the pupils are usually dilated because of the constant irritation of the sympathetic.

Contraction to light is a reflex action, the optic nerve serving as the afferent, and the third nerve serving as the efferent nerve. The degree of contraction depends upon the intensity of the light falling upon the retina. Light stimuli are conveyed by the optic nerve chiasm and tractus to the corpora quadrigemina, and, thence by Meynert's fibers to the center of the third nerve controlling the sphincter pupillæ, and thence by the third nerve to each sphincter. In the optic chiasm there is a semi-decussation of fibers, therefore, the stimulus of light even when applied to one eye alone, passes up each tract with equal vigor to both the right and left oculo-motor nuclei, thus causing consensual reaction. Furthermore there is a communication between the nuclei of the motor oculi, so that even when a lesion is located on one side beyond the chiasm consensual reaction takes place. Under normal conditions, therefore, both pupils must be of equal size and react equally to light, and inequality is always a manifestation of a pathologic condition.

In testing the reaction of the pupil to light, the patient's gaze should be directed to some distant object, the light cut off by the observer's head (covering both eyes) which should then be suddenly removed, and the effect of the sudden stimulus of light noted. The presence or absence of consensual reaction is shown by keeping one eye shaded while the other is exposed to the light, noting the effect on the shaded eye as well as the effect on the eye exposed.

The reaction of the pupil is of value in testing the presence or absence of light perception, but this evidence is not conclusive, as (a) perception of light may be present and reaction absent; and conversely, (b) reaction to light may be present in totally blind eyes. (a) Whenever the motor oculi or the branches supplying the sphincter pupillæ are paralyzed from any cause there will be no reaction, even though light perception exists; as, for instance, when atropin has been instilled. Reaction is also absent when the iris has become adhered to the anterior capsule of the lens from plastic inflammation. In these instances, unless both eyes are involved, consensual reaction is our

guide. (b) A lesion situated so high up in the optic tract that the fibers of the reflex arc are not affected, would produce blindness by cutting off the communication to the centers of sight, and yet would not prevent the reflex act of contraction to light. The same would hold true in cortical lesions, were all the perception centers involved. Instances of this latter character are, however, of rare occurrence. In the partial or total blindness of uremia (following pregnancy, scarlet fever, etc.), the pupillary reactions are preserved.

Miosis also occurs simultaneously with the effort of accommodation and convergence. Knies states that the contraction which occurs in accommodation is partly a mechanical process, the contraction being caused by the action of the ciliary muscle, the blood being forced into the iris, causing this structure to increase in size at the expense of the pupil. But this theory is incorrect because miosis does not necessarily occur when accommodation takes place, hence the contraction of the ciliary muscle can have nothing to do with the process. Miosis does take place always in the normal state upon convergence of the visual axes of the two eyes, and as accommodation and convergence are usually associated, it usually takes place with accommodation. The author has repeatedly made the test to confirm this point, and finds invariably that in the eyes of people who are able to free convergence from accommodation, no contraction of the pupil takes place upon accommodation, but as soon as convergence occurs the pupils contract. Furthermore, in people with extreme myopia, whose eyes do not accommodate, contraction of the pupils occurs upon convergence. Strictly speaking, therefore, it is incorrect to speak of "contraction of the pupils upon accommodation," instead of which we should substitute "contraction of the pupils upon convergence." The best explanation of this phenomenon is that the centers of convergence and pupil contraction are so intimately associated that the same stimulus produces a reaction of both muscles.

Miosis takes place, sometimes, from purely mechanical causes, as, for instance, when the aqueous humor is allowed to escape, and this will occur in the dead as well as

in the living. If the vessels of the iris become filled with blood, the pupil contracts, even though there is no action on the part of the contracting muscle of the iris. Gifford (*Archives of Ophthalmol.*, July, 1895,) describes a contraction of the pupil brought about upon a forcible contraction of the orbicularis palpebrarum. Irritation of the cornea or eyeball will cause miosis.

Mydriasis is brought about by the action of the dilator pupillæ, which is controlled by the sympathetic.

There is much controversy regarding the existence of this muscle. Those who claim its non-existence account for dilatation by a contraction of the vessels of the iris, causing a decrease in the width of the iris with consequent enlargement of the pupil, while others state that the posterior limiting membrane of the iris causes dilatation by virtue of its elasticity. After discussing all the evidence *pro* and *con*, Dwyer, in Norris and Oliver's System of Diseases of the Eye, concludes as follows: "The combined anatomical and physiological evidence of a radically arranged dilator muscle now appears conclusive." Experiments indicate that the dilating nerves are composed of vaso-motor and muscular fibres, hence it is probable that the contraction of the vessels of the iris plays its part in producing mydriasis.

The nerves governing mydriasis originate in the "front part of the floor of the aqueduct of Sylvius, pass to a region in the lower cervical and upper dorsal portion of the cord, and from thence pass out with the two first dorsal nerves, and by way of the rami communicantes, to the sympathetic in the neck and thence to the cavernous plexus, Gasserian ganglion, ophthalmic division of the fifth nerve, nasal branch of this division, ganglionic branch of this nerve, ciliary ganglion, there joined by nerve branches from the cavernous plexus, and from thence by the short ciliary nerves reach the eye."

Dilatation takes place upon absence of light, and upon the application of sensitive stimuli, such as galvanism, to different parts of the body, irritation of the fifth nerve terminals in the face, etc. Various emotions, such as fright and anger, will produce dilatation. Slight dilatation occurs on each ordinary inspiration, and is dependent upon a

variation of the blood pressure. Considerable dilatation occurs upon inspiration or expiration, said to be due to the retention of carbonic acid in the blood. Mydriasis occurs simultaneously with labor pains, probably on account of the associated action of the centers.

We may now pass on to the consideration of the changes which take place in the pupil under pathologic conditions.

Miosis may occur as a result of irritation of the pupil-contracting center or nerve fibers, or from paralysis of the pupil-dilating center or nerve fibers, or a maximum miosis will occur from a combination of both conditions. Likewise, mydriasis may be a result of irritation of the pupil-dilating centers or fibers or of paralysis of the pupil contracting centers or fibers, or maximum mydriasis will occur by a combination of both.

It has been experimentally proven that drugs that contract and dilate the pupil, act directly upon the nerve terminals in the iris, through the medium of the aqueous humor. Miotics, such as eserine, produce a maximum contraction, hence, they paralyze the peripheral endings of the sympathetic and stimulate the motor oculi. Mydriatics, such as atropine, are direct antagonists of these miotics, since they produce a paralysis of the peripheral endings of the motor oculi and stimulate the sympathetic. These drugs may, therefore, be used to differentiate an irritation, miosis or mydriasis from a paralytic miosis or mydriasis, for *in irritation miosis atropine will produce a maximum dilatation* by paralyzing the peripheral endings of the irritated nerve, (motor oculi) and by irritating the peripheral endings of the unaffected nerve (sympathetic) while *in paralytic miosis atropine will only dilate the pupil partially*, since it can only paralyze the unaffected nerve (motor oculi) and cannot irritate an already paralyzed nerve (sympathetic). *In irritation mydriasis, eserine will produce maximum contraction* by paralyzing the peripheral endings of the irritated nerve (sympathetic) and by irritating the peripheral endings of the unaffected nerve (motor oculi), but *in paralytic mydriasis eserine can produce only partial contraction* by paralyzing the unaffected nerve (sympathetic), having no effect upon the already paralyzed motor oculi.

Another easy, but unreliable means of differentiating the irritation from the paralytic form may sometimes be of value. I refer to the reaction to light and convergence. In irritation miosis the pupil does not react to light and convergence, while paralytic miosis reacts to both (excepting in the case of the Argyll-Robertson pupil). And in irritation mydriasis reaction to light takes place, but dilatation to sensitive or psychical stimuli does not, while in paralytic mydriasis reaction to sensitive and psychical stimuli is present, and reaction to light and convergence may, or may not be present, depending upon the seat of the lesion.

According to Swanzy and other authorities, irritation miosis is found in: 1. The early stages, at least, of all inflammatory affections of the brain and its meninges, in simple tubercular and cerebro-spinal meningitis. When, in these diseases, medium miosis gives place to mydriasis, the change is a serious prognostic sign, indicating the stage of depression with paralysis of the third nerve. 2. In cerebral apoplexy the pupil is at first contracted, according to Berthold, who points out that this contraction is a diagnostic sign between apoplexy and embolism, in which latter the pupil is unaltered. 3. In the early stages of intra-cranial tumors situated at the origin of the nerve (third), or in its course. 4. At the beginning of an hysterical or of an epileptic attack. 5. In tobacco amblyopia, probably from stimulation by nicotine. 6. In persons following certain trades, as a result of long maintained effort of accommodation (watchmakers, etc.), the pupil contracting center being subject to an almost constant stimulus. 7. As a reflex action in ciliary neurosis; consequently in many diseased conditions of those parts of the eye supplied by the fifth nerve. 8. In iritis.

Paralytic miosis occurs: 1. In spinal lesions above the dorsal region, *e. g.*, injuries and inflammations, especially of the chronic form. 2. In general paralysis of the insane. (In acute mania the pupil is usually much dilated, and when miosis develops, approaching general paralysis may be prognosticated.) 3. In myelitis of the cervical portion of the cord, following irritation mydriasis. 4. In bulbar paralysis, with progressive muscular atrophy

or sclerosis of the brain and spinal cord. 5. In alcoholic amblyopia. 6. In paralysis of the cervical sympathetic, resulting from injury, from pressure of an aneurism of the carotid, innominate or aorta, or from pressure of enlarged lymphatic glands. 7. In apoplexy of the pons Varolii (this may be irritation miosis). 8. In poisoning by certain drugs known as miotics.

Irritation mydriasis occurs: 1. In hyperemia of the cervical portion of the spinal cord and in spinal meningitis. 2. In the early stages of new growths in the cervical portion of the cord. 3. In cases of intra-cranial tumors and other diseases causing high intra-cranial pressure (these may cause paralytic mydriasis). 4. In the spinal irritation of chlorotic or anemic people after severe illness, etc. 5. As a premonitory sign of tabes dorsalis. 6. In cases of intestinal worms and other forms of intestinal irritation. 7. In psychical excitement, such as acute mania, melancholia, progressive paralysis of the insane (may be miosis on one side, mydriasis on the other).

Paralytic mydriasis occurs: 1. In progressive paralysis following miosis. 2. In various disease processes, such as syphilis at the base of the brain affecting the third nerve. 3. In a late stage of thrombosis of the cavernous sinus. 4. In orbital processes which cause pressure on the ciliary nerves. 5. In glaucoma. 6. In cases of large intraocular tumors. 7. In cases of poisoning by alkaloids known as mydriatics, and by toxic principles of putrefaction (rotten meat, etc.).

8. Following diphtheria. 9. Following a traumatism to the eyeball.

The Argyll-Robertson pupil is one that reacts to convergence but not to light, and indicates a lesion of the centripetal fibers, in the case of tabes dorsalis probably Meynert's.

The late Dr. Richard Macdonell, of Montreal, describes a unilateral dilatation which he states is sometimes present in tuberculosis of the lungs, and indicates a cavity on the side of the dilated pupil. This observation was probably first made by Rampoldi.*

*See an article by Dr. Casey Wood, of Chicago, "Is there a Rampoldi's Sign *Medicine*." January, 1896.

Reaction of the pupil in hemianopia is of importance in diagnosing the location of a lesion in the brain. A lesion is anterior to the primary optic centers in hemianopsia, if miosis takes place when light is thrown upon the seeing side of the retina, and does not take place when thrown upon the blind side. A lesion is posterior to the primary optic centers when miosis occurs when the light is thrown upon either side of the retina.

The action of atropin has been described; of other mydriatics which act in the same way, hyoscyamin, duboisin and daturin should be mentioned. Cocain produces mydriasis by irritatintg the nerve endings of the sympathetic. The mydriasis produced by strychnin and curare poisoning is due to the retention of carbonic acid in the blood.

Drugs that produce miosis in the same manner as eserin are pilocarpin, muscarin, nicotine and morphine.

The action of chloroform upon the pupil is as follows: At first, in the excitement stage, there is a dilatation due to the stimulation of the pupil-dilating center, followed in the next stage by the gradual contraction due to paralysis of this center, when no stimulation will cause dilatation. Further inhalation will cause irritation of the pupll contracting centers producing maximum contraction. If then too much is given, a rapid dilatation will follow, indicating paralysis of the pupil contracting centers, a symptom of dangerous significance.

In conclusion, the following points may be emphasized:

1st. That there is no standard of size for the pupil in health, but inequality of the pupils is always pathological.

2d. That contraction of the pupil in health should take place upon the application of light stimuli or convergence of the eyes, but not necessarily upon accommodation.

3d. That dilation of the pupils in health should take place when causes producing contraction are removed, or upon irritation of the sympathetic system.

4th. That miosis and mydriasis in disease may be due to irritation or paralysis, and that the use of eserine or atropine will determine this point.

5th. That the pupil is a valuable guide in the administration of chloroform.

ABSTRACTS FROM RECENT GERMAN OPHTHALMIC LITERATURE.

Quarter Ending April 1st, 1898.

BY

H. V. WÜRDEMAN, M. D.,

OF

MILWAUKEE, WIS.

Tuberculosis of the Eye.—Surgical Treatment of High Myopia.—Extraction Downward Without Iridectomy.—Open Wound Treatment.—Causes of Retinitis Pigmentosa.—Our Yellow Salve.—Chemistry of Atropin Alkaloids.—Hyoscin and Hyoscyamin.—Scopolamin and Atroscin.—Alrol-Paste. Neuro-Retinitis-Hemorrhagica Cured by Iron.—Keratitis Following Influenza.—Cataract in Glassblowers.—Xerosis Bacilli.—Amaurotic Form Familial Idiotcy.—Primary Syphilis of the Eyelids.—Strabismus.—Operative Treatment for High Myopia.—Paralysis of Ocular Muscles Through Metastatic Tumors; Localization by Roentgen Rays.—Cortical-Physical Blindness.—Heat in Gonorrheal Ophthalmia.—Difficulties in Localization of Cerebral Tumors.—Cocain and Holocain.—Injuries of the Orbit.—Electro-Diagnosis of Oculo-Motor Paralysis.—Zeemann's Entoptic Phenomenon.

Tuberculosis of the Eye.

LOBOWSKI. (*Archiv. f. Augenhkde.*, XXV., 2 and 3, 1897.) The right eye of a 28 year old man was enucleated on account of intense pain. It had the clinical appearance of acute glaucoma and had been blind three months. The anatomical examination showed extensive tuberculosis of the ciliary body and of the lower half of the retina. This case was especially interesting, as it was a contradiction to the observation of Wagenmann that in

diseases of the ciliary body the bulb is usually soft. From this condition there arose fulminating glaucoma, the retina and choroid remaining relatively intact. H. V. W

Surgical Treatment of High Myopia.

FROELICH, C., Berlin. (*Arch. f. Augenhkde.*, XXV., 4, 1897.) Following Schweigger, Pflüger, Sattler and von Hippel, he uses a strong, sharp Bowman's stop needle for discission in contradistinction to Fukala and Mooren, who use a Graefe knife. He believes that the difficulty of the operation is diminished by having the pupil large and not losing the aqueous. The point of incision lies in the middle of inferior temporal quadrant of the cornea; he makes a crossed incision in the center of the lens capsule, so that the fragments of lens and capsule do not so readily rub against the iris. Where complicated by secondary glaucoma he does paracentesis. He follows the injunction of Fukala and Their, that "it is better to have the case a longer time under treatment than to run the risk of glaucoma." The posterior capsule should never be cut. One should not be too hasty in making linear extraction, and should then not make the cut in the cornea too small. This is usually made above in the corneal tissue. For secondary cataract operations he uses the Keratome, and, afterward, the cystitome, but has recently used the linear Graefe knife. In two cases, immediately after the operation, the myopia took on a progressive character, which is believed to be due to retinal detachment. If, in the course of ten years, these eyes, which have been recently operated upon without ill effects, preserve their function, we may place the operative treatment of high grades of myopia in the same position as that of iridectomy in glaucoma, and place Fukala by the right hand of Albrecht v. Graefe. To determine the proper worth of this operation it is necessary to have many reports of many operations and a large amount of material. F. has operated in fifty eyes during two years, twenty double-sided, ten one-sided operations. In twenty-three cases course of healing was not complicated. The complications were as follows:

I.—After the Discission.

Adhesion of the pupillary margin of the discission wound...2 cases.

Opacity of the discission canal.....	1 case.
Posterior synechia.....	3 cases.
Iritis, with thick secondary cataract.....	1 case.
Glaucomatous increase of tension.....	2 cases.

II.—After the Linear Extraction.

Healing of periphery of iris in the corneo-scleral wound.....	6 cases.
Impaction of the lens capsule in the fresh corneal wound.....	4 cases.
Iritis, with hypopyon.....	2 cases.
Posterior synechia.....	5 cases.

III.—After the Operation of Secondary Cataract.

Detachment of retina.....	1 case.
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IV.—After Full Healing,

Detachment of the retina.....	2 cases.
Increase in pathologic disease of the fundus.....	2 cases.

H. V. W.

Extraction With the Downward Flap Without Iridectomy.

SCHWEIGGER, C. (*Arch. f. Augenhkde.*, XVI., 1 and 2, 1897.) The elegant results which v. Graefe first obtained by linear extraction in soft cataract of young individuals naturally raised the hope that the same procedure could be used in senile cataract, but experience showed this not possible. The author shortly gives his experience with v. Graefe linear extraction with iridectomy, which in his own clinic was used up to 1887. Since that time he has largely used the old form of downward flap operation without iridectomy, much like that first brought forward by Richter more than a hundred years ago. About as many cases, however, have been operated upon by peripheral upward flap with iridectomy. He appends a table of 371 with iridectomy, and 450 without.

	With Iridectomy.	Without Iridectomy.
(1) Full results.....	278. 75.1 per cent.	346. 76.5 per cent.
(2) Secondary cataract. 71.	19.2 per cent.	84. 19.1 per cent.
(3) Loss.....	22. 5.7 per cent.	20. 4.4 per cent.

Through this it is seen that the secondary cataract, as well as loss of eyes from operation with iridectomy, is not less than that without. A second table is appended of 194 with iridectomy and 208 without, in which it is seen that the visual acuity of the latter is higher:

With Iridectomy, 194 Operations.			Without Iridectomy, 208 Operations.		
I. S. 1/2	-1	9 cases. 4.7 per cent.	54 cases.	26.0 per cent.	
II. S. 1/4	-1/2	68 cases. 35.0 per cent.	93 cases.	44.2 per cent.	
III. S. 1/7.5	-1/4	54 cases. 27.8 per cent.	35 cases.	17.0 per cent.	
IV. S. 1/15	-1/7.5	20 cases. 10.3 per cent.	7 cases.	3.4 per cent.	
V. S. 1/35	-1/15	9 cases. 4.7 per cent.	0		
Pre-Existing Complications.					
VI.		18 cases. 9.2 per cent.	6 cases.	3.0 per cent.	
Losses.					
VII.		7 cases. 3.6 per cent.	5 cases.	2.4 per cent.	
Incomplete Observations.					
VIII.		9 cases. 4.7 per cent.	8 cases.	4.0 per cent.	

By eliminating the cases of pre-existing complications, entire loss of the eye and incomplete observation of 160 cases with iridectomy and 189 without:

With Iridectomy, 160 Cases.			Without Iridectomy, 189 Cases.		
I. S. 1/2	-1	9 cases. 6 per cent.	54 cases.	29 per cent.	
II. S. 1/4	-1/2	60 cases. 42 per cent.	93 cases.	49 per cent.	
III. S. 1/7.5	-1/4	54 cases. 34 per cent.	35 cases.	18 per cent.	
IV. S. 1/15	-1/7.5	20 cases. 12 per cent.	7 cases.	4 per cent.	
V. S. 1/35	-1/15	9 cases. 6 per cent.	0		

The results obtained by the flap operation downward, without iridectomy, are very much better. In making the operation S. uses a wide cataract knife, in which, about 2 mm. from the point, both edge and back are sharp. The rest of the back is made thin and straight, but not sharp. The sides are slightly convex, and the cutting edge is slightly curved, being about 10 cm. radius. The width 10 mm. from the point is 6 mm. For fixation of the eye he uses a two-arm Pamard's spear. He opens the capsule with the cystitome and uses the capsule forceps only where there is capsular cataract. The scissor operation, rather than that by the knife needles, is recommended for secondary cataract. He seldom finds it necessary to make an iridectomy, and describes its indications in full. Since 1896 he has modified this operation by *leaving a little bridge of conjunctiva at the lower part of the flap, which is not entirely cut through*, and believes that this conjunctival flap is a safeguard against prolapse of the iris. This operation is similar to that which Desmarres described in 1851. This flap is sometimes, as in the case of unruly patients,, an obstruction to the entrance of instruments and

delivery of the lens, as well as to reposition of the iris, and has to be cut through and then stitched at the end of the operation. In cases where it has been necessary to cut the iris he has been enabled to do so without pain to the patient by instilling 3 per cent. sterilized solution of tropa cocain into the anterior chamber. Three minutes after instillation the iris is completely insensitive. After the operation he instills esserin, changes the bandage in twenty-four hours, and again uses eserin. He has done this operation in one hundred cases since the beginning of 1897, with only two instances of iris prolapse. H. V. W.

The Open-Wound Treatment of Ocular Operations

HJORT, J., Christiana. (*Centralbl. f. prakt. Augenheilkde.*, November, 1897.) H. rejects Wolffberg's so-called modification of his open method for after treatment of eye operations, as he says that the latter's protective paper is really an occlusive dressing. The principles of his method are the following: 1. That the natural secretions of the eye, through the flow of tears and the movements of the eyelids, as long as the lacrimal secretions and passages are in order, produces his physiologic toilette of the eye," and are effective antiseptics. 2. That everything that hinders the mechanics of the lacrimal flow, or favors the production of micro-organisms in the mucous membranes, is dangerous. The occlusion bandage is thus, not only from its mechanical effects, but it warms the parts unfavorably. Anything that renders the eye hyperemic and the membranes succulent, like the irritating antiseptics (which he has given up), is of the same nature. 3. Epilation of the eyelashes must always be done, as this eliminates a large part of the infecting surfaces. The eyelids should be touched as little as possible in after dressings. It is especially necessary to cleanse the inner canthus and semi-lunar folds. 4. Finally, the practical results have proved the truth of the above observations. W.'s protection paper is claimed by its author to give the patient a feeling of security, to protect the eye from light and from foreign bodies, but H. says that such is not needed. He has operated upon eighty cataract cases of all natures,

losing one eye through endogeneous infection, and two cases had complications by which the restoration of vision was prevented. He claims that his results in the last two years are better by the open method of dressing than he had previously by his antiseptic dressings. H. V. W.

The Causes of Retinitis Pigmentosa.

SCHOEN, Leipzig. (*Centralbl. f. prakt. Augenhkde.*, January, 1898.) The etiology of retinitis pigmentosa is obscure. Out of seven cases S. found rachitis to exist in four. Many cases of chorio-retinitis-anterior and pigmentation of the retina, occurring in children and adults, have suffered from rachitis. The author has ascribed zonular cataract to cramp of the ciliary muscle and pulling of the anterior ends of the zonula fibers upon the capsule of the lens. To this cramp, and to the pulling of the posterior ends of the zonular fibers, are to be ascribed the symptoms of chorio-retinitis-anterior. S. divides retinitis pigmentosa in two groups, which are opposed to the conditions of cataracta-simplex sive accommodativa and cataracta-zonularis sive spastica, as the development of these are due to pulling upon the anterior ends of the zonular fibers. The stretching of the posterior ends during accommodation causes chorio-retinitis-pigmentosa-simplex, while cramp occurring in rachitis gives rise to chorio-retinitis-pigmentosa-spastica. The first cases may begin during the first years of life; the second, perhaps at the earliest, at 6 years of age. Both etiologic factors, with the rachitis, usually tend to the formation of astigmatism, which is shown by its existence in the worst cases of retinitis pigmentosa. For chorio-retinitis-pigmentosa-simplex, S. shows the possibility of its prevention by early correction of the error of refraction, especially in families where it is known to exist. In chorio-retinitis-pigmentosa-spastica the cure is the prevention of rachitis. H. V. W.

Our Yellow Salve.

SCHANZ, FRITZ, Dresden, (*Centralbl. f. prakt. Augenhkde.*, Jan., 1898,) recommends the following prescrip-

tion instead of the usual form of yellow oxide of mercury ointment:

R	Hydrarg. oxyd. flav.	- -	0.1—0.2.
	Adip. lanae.	- - -	-
	Aq. dest.	- - - -	aa 1.0.
	Vasel. Americ. alb. pur.	-	ad 10.1.

The author recommends it for the following reasons: The water containing salve is well borne by the eye, mixes well with the conjunctival secretion, does not become rancid, can be kept from degenerating by being placed in an opaque vessel and holds the medicament in very fine subdivision.

H. V. W.

Chemistry of the Atropin Alkaloids.

PINNER, A. (*Centralbl. f. prakt. Augenhkde.*, Jan. 1898.) Despite the full study of the action of the various mydriatics during the last 20 years the chemistry is not yet entirely understood. In the several solanacia, the atropa, hyoscyamus, datura, mandragora, solanum anisodus there are at least two alkaloids. The one $C_{17}H_{23}NO_3$, the other $C_{17}H_{21}NO_4$. The second is supposed to be an oxidation product of the first. Hyoscyamin is readily changed through the effect of the alkalies into an isometric base which is atropin, the latter is found in more or less amount in many well known plants and it is possible that the living plants only contain hyoscyamin which through the death of the plant is afterward changed into atropin. The second base is hyosin or scopolamin. It seems that hyoscin is also acted upon by alkalies and "inactive" scopolamin or atroscin produced. Besides this hyoscyamin as well as atropin can readily be changed into apo-atropin or atropamin which likewise can be reduced to the isomere belladonnin, $C_{17}H_{21}NO_2$. Belladonnin is likewise found in plants and is the principal source of atropin. From the difficulty of systematizing these alkaloids there have been a number of descriptions under different names of the same alkaloids, for instance! hyoscyamin which is extracted from the root of the atropa belladonna and contains hyoscyamin and mixed with a more or less amount of atropin. The atropin of commerce which is called strong atropin and is denom-

inated by the pharmacopea to be the only officinal preparation under its sulphat and hyoscin, or scopolamin the bromid of which is officinal. It is mostly extracted from the root of the *scopolia atropoides* and contains active hyoscin as well as inactive atroscin and a small amount of hyoscyamin and atropin. Duboisin, besides hyoscyamin, contains hyoscin and other unknown alkaloids.

H. V. W.

Hyoscin and Hyoscyamin.

EMMERT, E., Bern, (*Centralbl. f. prakt. Augenhkde.*, Jan., 1898,) claims that hyoscin-scopolamin is, on account of its complete action, the best mydriatic. The chemical qualities of hyoscin are the same and the chemical use shows them to be the same. All authors agree that hyoscin scopolamin is five times as strong as atropin in 1:1000 solution, in its quickness, intensity, duration and manner of effect on pupil and accommodation, its harmlessness to the conjunctiva and the absence of danger from its general effects to the brain and heart, and the permanency of its solutions.

H. V. W.

Scopolamin and Atroscin.

MEYER, OTTO, Breslau, (*Klin. Mon. f. Augenhkde.*, Jan. 1898,) has made comparative experiments with these two drugs in pathologic cases. Upon the recommendation of Prof. Uhthoff and G. Schmidt the latter of whom had first used atroscin which was first described in the reports of the chemical factory of Königshöfer and Hesse. A 0, 1 per cent. solution of atroscin acted more strongly in iritis than a 1 per cent. solution of atropin. In two cases M. was able to break away synechia by one instillation of atroscin which had been treated with scopolamin without any effect. Both drugs cause increase of intra-ocular tension and slight irritation. The author disagrees with Königshöfer and Hesse as he finds no more effect upon the accommodation with atroscin than with scopolamin. In a few cases there were more or less toxic symptoms from both drugs such as vertigo, redness of the face, interference with the pulse, slight dryness in the

throat, as well as full or partial action upon the accommodation. Scopolamin and atropin are allied substances and are not to be differentiated through their solubility and optical results. Under the same chemical conditions in which hyoscyamin is converted into atropin active scopolamin is converted into inactive scopolamin alias atropin.

H. V. W.

The Use of Airol-paste of Bruns for Ophthalmic Purposes.

HERNHEISER, J. (*Woch. f. Therap. u. Hyg. des Auges.*, No. 3, 1898.) Bruns recommends instead of an occlusive bandage for sewed wounds, paste consisting of 20 per cent. airol mixed with mucilage in the following proportions: Airol, mucilage gum arabic, glycerine, each 10 parts; bolus alba, 20 parts. This paste is smeared thickly upon the wound after being sewed, and rubbed in with the finger so that a little gets into each needle opening. Over this a thin piece of cotton is laid. Further bandage is not necessary. Suppuration of the stitch holes is excluded by the protection given by the airol paste. H. has used this paste after ophthalmic operations such as ptosis, epithelioma, wounds of the lid, excision of cicatricies. He has modified this paste in the following, airol 5.0 linim, exsiccans. (Pick), bol. alb. aa 10.0, which is easier to spread on the eye-lids and sticks better.

H. V. W.

A Case of Neuro-Retinitis Hemorrhagica Cured by Administration of Iron.

ELZE, K., of Zwickau, (*Woch. f. Therap. u. Hyg. des Auges.*, Feb. 10, 1898), reports a case of a girl aged 17 who had dysmenorrhea in whom there was seen by the ophthalmoscope a one-sided neuritis optica with stroke-like hemorrhages in the retina, which must have come on suddenly. Between the macula and nerve head there was a large white spot of choroidal maceration which seemed to be the site of a previous existing hemorrhage which had been resorbed. Iodid of potassium and salicyat of soda were given without result. The chlorosis called attention to the necessity of giving iron which cured this condition

as well as the dysmenorrhea and the tendency toward neuro-retinitis. H. V. W.

Parenchymatous Keratitis Following Influenza.

HELBERT, R., of Sensburg. (*Die Ophth. Klinik.*, Feb. 20, 1898.) After the great epidemic of influenza in 1891, Pflüger had observed that keratitis parenchymatosa was one of the most common after-affections of the eye from influenza. Other cases were reported later. H. reports the case of a 18 year old male who was otherwise strong and healthy, who, in October, 1897, had influenza, staying in bed 10 days, and 7 days later having poor sight in both eyes, lacrimation, reddening in the eyes and pain. The visual acuity became less and when he appeared for treatment he had no sign of syphilis or scrofulosis and was otherwise healthy except a slight catarrhal bronchitis. The ophthalmic process was that of typical parenchymatous keratitis. Under treatment, by the dark room, atropin, warm compresses and pilocarpin sweats, this entirely disappeared in the course of 6 weeks. H. V. W.

Cataract in Glassblowers.

HIRSCHBERG. (*Berl. Klin. Woch.*, Feb. 7, 1898.) The etiologic connection between cataract formation and occupations entailing exposure to intense heat, as well as residence in hot climates, has long been recognized. Of 30 men employed as glassblowers, but 5 had reached the age of 40, and all of these had developed *glassblowers' cataract*. The frequency of cataract in India is well-known. The comparative early age at which this affection develops, as the result to exposure to heat, has never before been dwelt upon. Whereas in senile cataract the average age is in the neighborhood of 66 years, in glassblowers cataract and among the inhabitants of India the average is 40 years. H. V. W.

Identity of the So-called Xerosis-bacilli of the Conjunctiva with the Hoffman-Löffler Pseudo-diphtheria-bacilli of the Pharynx.

AXENFELD, (*Berl. Klin. Woch.*, Feb. 28, 1898), writes

that in his experience xerosis-bacillus grows much more slowly upon agar-gelatin and blood serum and does not render bullion turbid or alkaline. It seemed to grow more rapidly, however, when taken from pathologic than from normal mucous membranes. In 4 cases of conjunctival diseases xerosis-colonies were obtained which resembled the Hoffmann-Löffler colonies in their growth. It has not been possible to derive one form from the other, and it is thought that they represent two forms from one family. It is believed that the xerosis-bacillus is a form of the other modified by the conjunctival secretion, although the Hoffmann-Löffler bacillus may be found in normal conjunctival secretion without having lost its peculiarities.

H. V. W.

The Amaurotic Form of Familial Idiocy.

SACHS, (*Deut. Med. Woch.*, Jan. 20, 1898), describes a peculiar disease first recognized by ophthalmologists on account of the peculiar eye-grounds. These present a diffuse white spot in the macula lutea with a brown center. S. has also found peculiar changes in the cells of the cerebral cortex. The symptoms are: 1. Psychic disturbances that appear in early life (1st or 2nd year) and progress to total idiocy. 2. Paresis, and ultimately complete paralysis of the extremities, which may be either flaccid or spastic. 3. Increased, decreased or normal tendon reflexes. 4. Partial, followed by total, blindness (macular changes with subsequent atrophy of the optic nerve). 5. Marasmus and death, usually before the second year. 6. Distinct familial type. Occasional symptoms are nystagmus, strabismus, hyperacusis, or impairment of hearing. The pathologic changes are primitive type of cerebral convolutions, macrogyria, degeneration changes in the large pyramidal cells, absence of the tangential fibers, and decrease of fibers of the white matter. Blood vessels are normal. There is also degeneration of the pyramidal columns of the cord. The other organs are normal and there is no trace of syphilis. S. has collected 27 cases, of which 17 occurred in six families, and 10 were apparently sporadic. All were in Jews, but from the analogy of similar familial diseases of the nervous system

(Friedreich's ataxia, etc.), he is inclined to believe that this is partly accidental. Syphilis and alcohol could be excluded in all cases, but in some there was neuropathic heredity, consanguinity of the parents, injuries or disease during pregnancy.

H. V. W.

Primary Syphilitic Lesion of the Eyelids.

GAGZOW. (*Deut. Med. Woch.*, February 10, 1898.) The eyelids are rarely the seat of extra-genital chancre. G. records the case of a 15-months-old child, in which the inner canthus was the seat of the lesion, the disease being transmitted from mucous patches on the father's tongue. Under mercurial inunctions and a local iodoform dressing the ulcer promptly underwent resolution, and the general glandular enlargement subsided. The excessive induration described by Joseph as complicating a similar case, was not observed.

H. V. W.

Two Cases of Strabismus.

SCANABEL. (*Wien. Klin. Woch.*, No. 47, 1897.) attempts to explain the causal relation existing between hypermetropia and convergent strabismus. In his opinion hyperopia does not, in order to make accommodation easier, cause a convergent strabismus in a normally placed pair of eyes, as Donders teaches, but it only prevents a late development of the pre-existing strabismus, which is independent of both hypermetropia and muscle disturbances. The author believes that strabismus is an anomaly of position and not of motion of the eyes, and elaborates his opinions in the study of two illustrative cases.

H. V. W.

The Status of Operative Treatment for High Grades of Myopia.

MAGEN, O. (*Wien. Klin. Woch.*, 1 and 2, 1898.) Discission is the method most to be recommended for operation upon the lens in all cases of high grades of myopia for all ages. The nucleus of the lens in high grade myopia even in old persons is never hard, and thus age is no

contraindication to the operation of discission. The degree of myopia should be over 10 D. to admit of operation. Detachment of the retina in one eye is no contraindication for the operation upon the other. Most surgeons operate upon both sides when possible. H. V. W.

Paralysis of the Ocular Muscles Occurring Through Metastatic Tumors.

✓ ELSCHNIG, A. (*Wien Klin Wöch.*, No. 5, 1898), describes two cases. I. In a woman, aged 73, who had carcinomatous destruction of the neck of the uterus. There were many small growths about the skin and general surface of the body, varying in size from a bean to a hazel nut. The left eye protruded slightly and there was ptosis and finally absolute loss of ocular movements on that side. The eye was not irritable and the pupils reacted well to light. There was anesthesia of the eyeball. Ophthalmoscopic examination was normal. The tumor could not be felt in the orbit, although the eye could not be pushed backward. Neuro-paralytic keratitis began, the patient dying of marasmus shortly after. Carcinomatous bodies were found in all of the glandular organs and in the muscles. Examination of the contents of the orbit showed spindle-shaped carcinomatous masses in all of the ocular muscles that arose from the apex of the orbit, there being two of these in the oblique superior. Horner has described a somewhat similar case. Primary new growths in the muscular tissue of the orbit are seldom seen. There is a preparation by Stellwag in the Prague Museum which shows a melanotic lump about the size of a bean in the belly of the internal rectus.

II. In the case of a 47-year-old man there was total ophthalmoplegia of the left eye, which had occurred through metastatic carcinoma of the left cavernous sinus. All of the blood vessels and nerves of the eye are in relation to the cavernous sinus, so that diseases of this sinus are of especial interest to the ophthalmologist. For five weeks before death, this man had ptosis, complete paralysis of all outer and inner muscles and abesthesia of the eyeball. The vision and ophthalmoscopic appearances were normal. There was no exophthalmus. The patient

had complained mostly of toothache in the upper jaw of the left side. For some time had a rapidly growing tumor in the region of the thyroid gland. The case was first seen by E. in the dead room, where there was found on post-mortem a carcinoma of the thyroid gland with perforation of the right jugular vein and thrombosis of the right pulmonary vein, and metastasis into the region of the left cavernous sinus which compressed the cranial nerves. The oculo motorius was reddened; the left cavernous sinus and neighboring parts were filled with a grayish yellow broken down mass, which was proved to be carcinomatous. E. remarks that thrombosis or closure of the sinus does not cause any increase in the size of the retinal veins or those of the superficial veins of the eyeball, as these vessels have very rich anastomoses. Thrombo-phlebitis of the cavernous sinus, such as occurs in connection with suppurative otitis, is accompanied by inflammation of the orbital veins and attended by decided changes in the eye, as exophthalmus and chemosis.

H. V. W.

Foreign Body in the Bulb.—Localization by Aid of the Roentgen Rays.

STÖCKL, C. (*Wien. Klin. Woch.*, No. 7), describes two cases from Fuch's Eye Clinic, in which foreign bodies could not be localized by the ordinary methods, the positions of which were ascertained through the aid of the Roentgen photographs. In ordinary exposure no contrasts of difference in shades are made in taking pictures of the skull. Any relation of an opening within the skull to the outside is not rendered possible. In order to render visible a fixed point upon the actinogram small plates of lead are fastened upon the patient with strips of adhesive plaster, and upon the outer edge of the orbit of both eyes, the outer edge of the eyelids; if possible, on the middle of the upper and lower edge of the orbit of the injured eyes, and lastly upon the bridge of the nose and both the outer canthus. These marks show dark shades upon the fluorescent shield. In order to light the head through, (in profile) it is held so that the shades of both marks upon the outer edge of the orbit cover each other. From these

projection pictures the situation of the foreign body is estimated. In practice exact estimation is usually not necessary, as the position of the foreign body may usually be closely estimated without photographing the part. Lines drawn between the four shades form a cross whose angles are right angles and form four quadrants, within which the shadow of the foreign body will fall. By this method, Fuchs localized and successfully extracted in one case a shot, in another case a piece of copper. H. V. W.

Two Cases of Cortical and Pychical Blindness.

LUNZ, M. A. Moscow. (*Deut. Med. Woch.*, No. 38, 1897), enriches the literature on this subject by two cases. Thirty-seven have been previously reported. The first one died and the autopsy showed arterio-sclerosis of the ant. cerebr. post., and spots of softening in both occipital lobes. The second one was helped considerably by anti-syphilitic treatment, so that the optical memory pictures as well as the ability to identify new optical impressions with former ones, was partly recovered. In this case there was entire loss of color vision and alexia, which also partially improved, H. V. W.

Heat in Gonorrheal Ophthalmia.

QUINCKE, H., Kiel. (*Berl. Klin. Woch.*, December 6, 1897), in this article recommends the application of hot compresses made by cloths moistened with boric acid solution which are kept to a temperature 3.8 deg. cent. over that of the body by means of a siphon apparatus, the heat being conveyed by tubes and applied to the compress by a hollow metal cup or apparatus through which the water flows, the water being kept at a proper temperature by a spirit lamp.

(A similar appliance made by the Hot Appliances Co. has been used by the editor with advantage.)

He recommends this in gonorrhea and gonorrheal ophthalmia, as the cocci die at a temperature of 39 to 42 degrees cent. The idea is the same recommended by Knies in *Berl. Klin. Woch.*, No. 13, p. 98. "Die Hydrotherapie in der Augenheilkunde," by Dr. Gutmann and abstracted

by the editor for the ANNALS OF OPHTHALMOLOGY, see January, 1887. p. 208, in which body baths to 40 deg. cent. are recommended.

H. V. W.

Difficulties in the Localization of Cerebral Tumors.

BRUNS, L., (*Wien. Klin. Rundschau*, No. 46, 1897), points out the ordinary differential diagnostic signs of cerebral tumors and suggests means by which they may be supplemented. Disturbances of equilibrium characterize tumors, both of the frontal lobe and of the cerebellum, whence confusion between tumors in these two situations is often occasioned. In most cases, however, careful examination of the general and local symptoms will establish a diagnosis, this being found markedly different when the tumor is in the frontal lobe and when it is in the cerebellum. Homonymous hemianopsia is of little value in the topical diagnosis of tumors. If, however, right homonymous hemianopsia is from the beginning associated with alexia and word blindness, a tumor in the white matter of the left occipital lobe would be inferred. The localizing symptoms of tumors in the cortex of the central convolutions, particularly in the frontal and parietal lobes are often difficult to distinguish from those of the motor area itself. In cortical cases, B. particularly recommends the method of percussion introduced by Macewen. He considers the anomalies of cranial percussion, tenderness, tympanites and "cracked-pot" sound of great importance for the general diagnosis, when they are marked and exhaustive, for local when they are distinctly circumscribed. The local diagnosis is particularly facilitated when the conjectural seat of the brain symptoms concurs with the evidence of percussion. In the case of difficult diagnosis between tumors of the motor area and its vicinity, circumscribed changes of percussion may lead to the conclusive diagnosis and thus be even more important for localization than the cerebral symptoms. Markedly localized tenderness and tympanites are scarcely possible except when the tumor is in the cortex.

H. V. W.

A Comparison of Cocain and Holocain.

LE GRANGE. (Meeting Gessells. f. Med. Chirurg. z.

Bordeaux, November 10, 1897. *Die Ophth. Klinik.*, January 20, 1898), used cocain and holocäin for sixty operations, arriving at the following conclusions:

I. Holocäin more thoroughly anesthetizes the inflamed conjunctiva than does cocain.

II. Holocäin does not affect the corneal epithelium; does not produce mydriasis nor accommodative paralysis, and does not affect the intra-ocular tension.

III. Holocäin excels cocain in operation upon the diseased conjunctiva.

IV. It is to be preferred for extra-bulbar operations, such as pterygium, tenotomy, etc.

Cocain is to be preferred when the intra-ocular pressure is lowered. For cataract extraction he prefers the following formula:

R _x	Holocäin mur.	-	-	0.05.
	Cocain mur.	-	-	0.1.
	Aq. dest.	-	-	10.00.

One drop of this solution causes complete anesthesia. The tension is a little lowered and the delivery of the lens thus rendered more easy.

H. V. W.

Injuries of the Orbit.

✓
CRAMER. (*Monatsbl. f. Unfallhkde.*, No. 9, 1897,) 1. Foreign Body in the Orbit—An 8-year-old female had forced a knitting needle through the lacrimal region into the orbit. There was edema of the lid and redness of the under part of the conjunctiva. At that time it could not be determined whether or not the knitting needle had been broken off. Two months later there was a fistula in the superior retro-tarsal fold. The eye could not be turned down. A foreign body could be felt by the probe about 2 cm. deep. Under narcosis the fistula was opened up and a portion of the knitting needle, 62 mm. long, removed. Healing followed. The largest portion of this foreign body must have gone through into the posterior portion of both nasal passages, perhaps so far that it pierced even to the right orbit. 2. There was left sided pulsating exophthalmos and spurious aneurism within the orbit which had been caused by injury from a knitting needle in a female

child 8½ years. 3. Rupture of the canalis opticus. A 28-year-old woman had received an injury in the inner portion of the roof of the right orbit. She could not see anything, but had no other difficulties. A few days later the eye was badly swollen and pressed forward, when there was found to be a wound in the supra-orbital canal, edema of the upper lid, chemosis of the conjunctiva, dilated pupil, media clear, optic nerve pale, arteries small and the veins enlarged, almost black in color. In the region of the macula there was a dark brown-red swelling. C. diagnosed indirect rupture of the orbital wall which caused exophthalmos a few days later. H. V. W.

Electro Diagnosis of Oculo-Motor Paralysis. ✓

WERTHEIN-SALOMONSON. (*Neurol. Centralbl.*, January 15, 1898), has attempted to utilize electricity in the diagnosis of oculo-motor paralysis. The only muscle that is accessible is the levator-palpebræ. He reports a case that exhibited irritability of the muscle on the 16th day, and in the course of time gave the characteristic reactions of degeneration. In mild cases, and in one case of congenital ptosis, contractions could not be obtained. The muscular irritation that usually occurs in the course of degeneration appeared to be absent in ptosis caused by nuclear or fascicular paralysis of the third nerve. He was entirely unable to test the muscles of the bulb. H. V. W.

An Explanation of Zeemann's Entoptic Phenomenon.

SIETHOFF, E. G. A., Deventer. (*Zeitschrift f. Psych. and Phys. der Sinnesorgane*. Bd. XIV., 5, p. 375.) If in the dark a not too intense source of light observed through a narrow vertical slit in a dark shield, two curved elliptical light violet-colored horizontal stripes are to be seen toward the temporal side. The two ends of these stripes come closely together but are not seen to join. To the nasal side of the slit there are two stripes, one upon the other, so that they make a segment of a circle. This phenomenon, first described by Zeemann, is supposed by S. to be a complimentary entoptic after-image caused through stimulation of the perceiving elements in the neighbor-

hood of the macula lutea. The violet color of the after-images is to be explained from the yellow color of the macula lutea. The violet stripes spread as far as the blind spot and one can easily be convinced of this by the after-appearances of this phenomenon upon the shield itself, if later the position of the blind spot is estimated with the shield the same distance from the eye. The author thinks that the position of the phenomenon lies in the edges of the yellow spot, which is formed by nerve bundles surrounding it above and below. This observation is a new proof that the light perceiving elements of the retina lie behind the yellow colored region of the nerve bundles and back of the other retinal layers, in the rods and cones.

H. V. W.

ABSTRACTS FROM CURRENT AMERICAN AND ENGLISH OPHTHALMOLOGICAL LITERATURE.

BY CHARLES H. MAY, M. D.,

NEW YORK.

Cataract Statistics With Comments.

KNAPP, HERMAN, M. D., New York. (*Journal of Amer. Med. Assn.*, Jan. 8, '98.) The following chapter is part of a very instructive and interesting paper with the title given above:

Complicated Cataracts, Their Nature and Treatment, with Final Results.—Among the 400 cases 57, that is, 14.25 per cent., showed the one or other complication, namely: (1) Diabetes, 6 cases; 5 smooth, 1 protracted recovery. This agrees with my previous experience that diabetes had not so bad an influence on the recovery from cataract operations as is stated by some authors. (2) Albuminuria, 2 cases; good recoveries. (3) Diabetes and albuminuria, 2 cases; good recoveries; the one had retinal hemorrhages which, two years later, had disappeared with S-20-20. (4) Gout, 1 case; healing slow, result good. (5) Rheumatism, 1 case; good. (6) Insanity, 3 cases; 2 failures by suppuration, 1 good visual result, but patient on the day of discharge committed suicide. (7) Chronic bronchitis, cough, 2 cases; 1 good, the other perception of light (partial suppuration). (8) Traumatism, 3 cases; good. (9) Foreign body in lens (came out with cataract), 1 case; good. (10) Chronic dacryocystitis, 6 cases; 3 good, 3 failures by suppuration. (11) Excessive myopia, 4 cases; good, but one had sudden detachment of the retina seven months after discission. (12) Synchysis, 3 cases; good. Diagnosed by copious escape of watery fluid during the section, cataracts expelled by external manipulation. (13) Choroiditis, disseminate and atrophic, 3 cases; recoveries smooth, (14) Chronic irido-choroid-

itis, 8 cases; 7 yielded satisfactory results from V. 4-200 to 20-70, 1 was a failure from closure of the pupil after cysto-iridectomy. (15) Macula cornea, 4 cases; good. (16) Chronic glaucoma, 3 cases; recoveries smooth. (17) Optic nerve atrophy, 2 cases; recoveries good. (18) Nystagmus, congenital, 1 case; good. (19) Chalky lens, dislocated into anterior chamber, 1 case; good operative success. Lens expelled by external manipulation, with permanently round pupil. (20) Previous syphilis, 1 case; good. There were 8 failures among the 57 cases of complicated cataract; *i. e.*, 14 per cent. Of the cases of dacryocystitis 50 per cent. were lost.

Bacteria in the Normal Conjunctiva, and the Effects Upon Them of Aseptic and Antiseptic Irrigations.

RANDOLPH, ROBERT L., M. D., Baltimore, Md. (*Journal of the Amer. Med. Assn.*, Jan. 8, 1898.) The writer made a series of experiments upon 100 persons (not eye patients), using the conjunctival secretion of these persons for inoculation on nutrient agar. Out of the 100 cases there were only 13 sterile tubes. No effort was made to determine the properties of the micro-organism.

Two series of experiments of 50 each were made, one to test the aseptic, and the other the antiseptic method of sterilizing the field of operation. After repeated irrigation of the conjunctiva with sterilized water inoculations showed a growth in 32 out of 40 tubes. After flooding with solution of bichloride 1 to 5000, and inoculation with conjunctival secretions, there were only 9 sterile tubes. These experiments showed that, as far as the conjunctiva is concerned, little reliance can be placed on the usual methods employed by ophthalmologists for obtaining a sepsis. Dr. Randolph adds the following *conclusions*:

"The normal conjunctiva always contains bacteria. It is probable that the bacteria found in this locality are usually of only slight, if any, pathogenic character. It should be remembered, though, that bacteria ordinarily non-pathogenic may become harmful under certain conditions; that is, if the tissues are bruised by instruments, or irritated by chemicals. Neither the irrigation with sterilized water, nor the instillation of a sublimate solu-

tion (1 to 5000) produces sterility of the conjunctiva, and, inasmuch as both measures are futile and possibly harmful, they may just as well be abandoned. These methods of sterilizing the conjunctiva are the ones usually employed by ophthalmologists, and hence the choice of them for testing this question. It goes without saying that a method which would destroy the bacteria of the conjunctiva, without at the same time impairing the integrity of this membrane, would be a great advantage. In operating upon the normal conjunctiva, as in cataract operations, the surgeon in the present state of our disinfecting armamentarium would do well to consider the subject of antiseptics chiefly, if not solely, in connection with his hands and instruments, and of course the cocain and atropin."

The Best Methods of Sterilizing Ophthalmic Instruments and Solutions of Myotics and Mydriatics.

DESCHWEINITZ, E. A., M. D., Washington, D. C. (*Journal of the Amer. Med. Assn.*, Jan. 8, '98.) The writer describes a number of experiments which lead him to the conclusion "that trikresol, 1 to 1000, with a separate bottle full to hold and rinse the pipettes, or 1 to 5000 formaldehyde solution and a special dropper (which he describes) for collyria, and formaldehyde gas for instruments, are, from the bacteriological standpoint, the best methods of disinfection."

The Etiology and Treatment of Suppurative Disease of the Frontal Sinuses.

MILLIGAN, W., M. D., Manchester, Eng. (*The Lancet*, Feb. 19, 1898.) As a result of the study of 15 cases of frontal sinus disease occurring in his own practice, and a number of others observed while under the care of friends, the author has presented an instructive paper, to which he appends the following conclusions regarding treatment:

"1. In cases of acute frontal sinusitis rest in bed, warmth, local depletion, and intra-nasal treatment should first of all be undertaken. 2. In cases of acute sinusitis with obstructed duct, which do not react to local treatment within 48 hours, external operation should at once be re-

sorted to. 3. In cases of chronic suppurative frontal sinusitis (latent empyema) it is advisable to, first of all, give intra-nasal treatment a fair trial; *e. g.*, washing out the sinus when possible, destruction of all redundant and polypoid mucosa so as to facilitate intra-nasal drainage, and the performance of an anterior turbinectomy. 4. In cases of latent empyema where local treatment fails, and where attacks of subacute sinusitis recur at intervals, an external operation should be performed. 5. In cases of latent empyema, where any symptoms of ocular or orbital disease supervene, opening and thoroughly draining of the sinus should be effected without delay, so as to avoid the risks of septic inflammation of the orbital contents and loss of vision. 6. In cases of latent empyema where symptoms of cerebral irritation or cerebral compression are present, the sinus should be freely opened from the outside, erosions of the bony parieties carefully looked for, and, if necessary, an opening made into the cranium, so as to explore the region of the anterior cerebral fossa."

The Operative Treatment of Ptosis.

VAN FLEET, FRANK, M. D., New York. (*Medical News*, January 1, 1898.) Dr. Van Fleet adds another to the many modification of Panas' operation for ptosis, consisting of making the lines of incision straight and in extending them only through the integument. He describes his method of operating as follows:

"The patient being anesthetized and the brow shaved, the face and forehead should be cleansed with a mercuric bichlorid wash. An assistant then inserts an ordinary horn shield under the lid, and with his free hand steadies the skin of the brow as directed by Panas. The operator makes an incision into the upper lid somewhat above the superior margin of the tarsal cartilage, commencing at the inner side and including the middle third of the lid. From the inner extremity of this incision another is made extending down to the ciliary border, and a third incision is made in like manner from the outer extremity of the first. The integument enclosed by these three incisions is dissected from the underlying tissues down to the ciliary border, and constitutes the flap. A final incision is made in

the brow parallel with the first, but slightly longer. The integument between the two is then undermined and forms the bridge. The parts are again carefully cleansed, the flap passed up under the bridge, and its upper margin stitched to the upper edge of the incision in the brow by means of five sutures. The outer and inner extremities of the final incision, *i. e.*, external and internal to the flap, are sutured. The wound dusted with iodoform, covered with bichlorid gauze and bandaged. The latter is left in place two days, after which it is removed and daily reapplied during a week, when the stitches should be removed and the dressings discontinued. The epithelium of the flap becomes macerated and exfoliates, and the true skin unites with the under surface of the bridge, of which it becomes a part, or, perhaps, disappears.

"I believe it is well not to make the flap too narrow, but better, perhaps, to include even more than one-third of the lid. Its length should vary with the degree of ptosis to be overcome, always bearing in mind that it is better to have too great, rather than too little, resulting elevation of the lid, as the subsequent stretching of the skin tends to counteract the primary results.

"Another point to be remembered is, that the shrinking of the bridge may cause deformity. This has occurred in three of my five cases, and was easily remedied by freshening the edges of the wound and again stitching them together.

"The two lateral sutures advised by Panas I have not employed, but think that it may, perhaps, be well to do so in future cases, not because of the possibility of resulting ectropion, for in this I do not believe, but because the two sutures mentioned serve to prevent stretching of the flap and consequent lessening of the good effect. Another question to be decided is, whether the stitches which unite the flap to the upper margin of the incision in the brow should include the upper edge of the bridge. This latter has a tendency to curl, and if the upper edge be fixed, the tendency to cicatricial distortion will be lessened. There may be other points to be considered, which will be suggested by individual operators."

A Further Report on Holocain as a Local Anesthetic in Ophthalmic Work.

WURDEMAN, H. V., M. D., AND BLACK, NELSON M., M.

D., Milwaukee. (*Ophthalmic Record*, January, 1898.) Since publishing a previous report, the writers have used this anesthetic several hundred times for numerous purposes and have studied its action in comparison with that of cocain and eucain. They have not yet tried eucain B. As a result of numerous trials in irritating applications as well as all sorts of operations, they have come to the conclusions, that:

"The anesthetic qualities of holocäin are equal to those of cocain and it is no more irritant. Holocäin *excels cocain for operations upon the bulb* in the following:

"Its action is quicker and more lasting.

"It more thoroughly anesthetizes the iris and deeper structures.

"It more thoroughly anesthetizes inflamed surfaces.

"The anesthesia may be indefinitely prolonged.

"The cornea does not desiccate under its use.

"It does not affect the tension.

"It does not act on the pupil or accommodation.

"It does not interfere with the nutrition of the tissues but rather increases their blood supply and hastens healing.

"Its solutions are antiseptic.

"It is already proportionately cheaper.

"The only disadvantage in the substitution of holocäin for cocain for anesthetic purposes is that bleeding is more free under holocäin, but the resulting blood clot, for instance, in muscle operating, is no greater and is as speedily absorbed. Cocain is likewise a cycloplegic and mydriatic, and its power to diminish congestion has a distinct therapeutic indication.

"Although holocäin has been found by us to possess these distinct advantages over cocain when applied as a pure anesthetic, it has not, and probably will not, entirely displace the older medicament. We are not enthusiastic over its effects, but have made a rather extensive trial of the drug in an attempt to prove the claims of Tauber and others, who have recently filled the pages of the European medical press with the results of their investigations. Only one author ascribes any ill effect to its use, and his conclusions may be received with doubt. Hotz has ob-

served that penetration is not as deep, but he has only experimented with a single solution of one per cent. strength. In our practice no toxic effects have been observed from holocain, and indeed although we have also used many ounces of cocain during the past dozen years, we have seldom seen any effect upon the system and believe that both these drugs are safe when properly used."

Anomalies in the Functions of the Extrinsic Ocular Muscles.

BULLER, F., M. D., Montreal, Canada. (*Ophthalmic Review*, December, 1897.) The writer states that although a complete and methodical examination will often enable the ophthalmologist to determine with precision abnormal conditions in refraction, accommodation and pathological conditions in the eye itself, when he starts to investigate the complicated problems presented in the functions of binocular vision, he feels that he is treading upon uncertain ground. Though a certain physiological variation is recognized in the power of accommodation and acuity of vision, this is probably less than in the case of the complicated piece of machinery which controls the motility of the eye. Since slight errors of refraction undoubtedly give rise to intense visual disturbances in certain individuals, there seems to be no reason why the same rule should not apply in cases of faulty or defective motility. There is no question as to the existence of serious visual and even systemic disturbances due to faults in extrinsic muscles of the eyes, especially those which render the function of binocular vision difficult and wearisome.

Dr. Buller presents a series of observations relating to this class of cases. He relied chiefly upon the equilibrium tests at six meters, and allowing for physiological variations from orthophoria, he attached little or no importance to lateral deviations of two or three prism degrees. He also neglected cases of hyperphoria which could not be shown to exceed one degree, although he says he is not prepared to assert that this amount or less may not cause more or less discomfort in some persons, and he believes that he has succeeded in relieving a few of such cases by prescribing a correcting prism.

As a standard of fusion power he accepted the follow-

ing: Abduction 5° to 8° , adduction 25° to 50° , sursumduction 2° to 3° . "This standard is not absolute, and it is chiefly useful for purposes of comparison. In every case where there is binocular vision, the range of fusion may be temporarily increased in any direction by systematic exercise of the muscles. I have seldom known this apparent increase in power to be long maintained after the exercise had been discontinued. Equal exercise of all the muscles will sometimes develop a preponderating power in a sense that did not exist before. This fact, when it occurs, is more significant than the original latent tendency. An habitual abduction of 5° and adduction of 25° (in the absence of hyperphoria) could hardly be regarded as abnormal, but an abduction of 5° with an adduction of 60° or more, and esophoria of more than 2° or 3° , would probably be sufficient justification for operative interference. When there is binocular vision with a latent tendency in any direction, and a considerable relative excess of power in the muscles acting in that direction, the fault may safely be corrected by operation — tendon relaxation or tendon shortening. Relief from headaches, asthenopia, and neurastenic symptoms often follow such operations; they are, therefore, not only justifiable, but positively indicated under such circumstances in the absence of refractive error, or where the refraction has been corrected without affording relief.

"A careful investigation of every case of muscular anomaly during a number of years in private practice has furnished from a material of 8,000 patients, 110 cases that seemed suitable for operative interference, *i. e.*, about 1.4 per cent.; they may be classified as follows: Esophoria 37 cases, exophoria 31 cases, hyperphoria 30 cases, hyperexophoria 10 cases, hyper-esophoria 2 cases. * * * * A study of the tabulated results shows that there were 39, or 35.4 per cent. of cases which may fairly be classed as cured: 37, or 33.6 per cent., greatly benefitted; 20, or 18 per cent., somewhat benefitted; 8 unimproved, and in 6 the result was unknown. Leaving out these last 14 cases, the operations would appear to have benefitted in 87 per cent. of all the cases so treated. This is perhaps as good a result as attends most surgical operations, and in this con-

nection I may add that I am not aware of any instance in which the result was actually injurious to the patient. I am, therefore, justified in claiming that the usual operations performed for the relief of persons suffering from the varying annoyances due to faulty muscular equilibrium, in carefully selected cases, are not only harmless, but in a very large percentage of such cases they are followed by satisfactory results in as large a percentage as are obtained, according to most statistics, in the operations for removal of cataract."

Dr. Buller gives particulars of all of these 110 cases arranged in tabulated form, and adds: "It will be observed that whilst there were many cases of refractive error among the 110 cases, there were also a great many with little or no refractive error, and in no case was an operation performed in the presence of a refractive error in which relief was not first sought by its correction. I cannot agree with those who contend that the correction of errors of refraction will always correct associated muscular faults. If this be true, how can we account for the many cases of muscular faults in which refraction is emmetropic? It is undoubtedly true that some of the lower grades of muscular faults may be benefitted by wearing suitable prismatic glasses, but the usefulness of these is exceedingly limited, and those who depend upon them are doomed to frequent disappointment.

"I have not had sufficient experience in the correction of muscular faults in persons suffering from epilepsy and chorea to say that they cannot derive benefit from ocular therapeutics or operations to secure equilibrium, but so far as my experience goes I am inclined to believe that little or no relief is to be expected from such treatment, at least *quoad* the functional nervous disorder, but I would not hesitate to recommend the scrupulous correction of refractive errors in such persons, or of any considerable muscular fault, if present, just as I would recommend the removal of every discoverable source of nerve irritation or cause of ill health, whatever it might be. A searching analysis of the 110 cases tabulated would bring out a good many interesting facts; for instance, among those cured, there were two of esophoria with normal refraction in

which the chief complaint was persistent vertigo, both entirely relieved by tenotomy of the internal recti; in neither of these, however, was there anything approaching epileptiform phenomena.

"The clinical investigation of functional muscular anomalies can only be undertaken at the expense of enormous loss of time and the exercise of unbounded patience on the part of the surgeon; hard conditions, it is true, but not too hard for him who delights in his profession and feels the joy of overcoming difficulties which have baffled others. If the results I have now placed on record are reliable, and I believe they are, being the outcome of many years patient observation and steady work, free, I hope, from partiality of any sort, then it follows that whoever ignores the injurious effects of muscular faults in ophthalmic practice, fails to accord at least one per cent. of his patients the benefits which a proper application of his knowledge should bestow."

A Method of Employing Kangaroo Tendon in the Operation for Shortening Ocular Muscles.

McREYNOLDS, JOHN O., B. S., M. D., Dallas, Texas. (*Journal of the American Medical Association*, January 29, 1898.) "Without attempting to review the subject of muscle shortening, I will briefly present a method which has been satisfactory in my experience on account of the short time required for its performance, its freedom from pain, and the accuracy with which any degree of heterophoria may be corrected. It may also be successfully employed as an auxiliary in those cases of marked strabismus in which complete tenotomies alone will not entirely correct the deviation. The method is as follows: "With broad fixation forceps provided with teeth sufficiently long to engage all the ocular tissues down to the sclera, grasp conjunctiva, capsule of Tenon and tendon of ocular muscle in such a way as to produce a loop of tendon. Then fix the loop thus formed by a single suture of kangaroo tendon embracing the ocular tendon. Tie the thread thus employed and leave it to be absorbed. In case there should be a desire to have the kangaroo tendon buried beneath the conjunctiva, short incisions through the mem-

brane will allow the thread to sink out of sight beneath the conjunctiva. The operation can be made in less time than a minute, involves no pain, or subsequent discomfort and will correct with precision any ordinary degree of heterophoria."

The Localization of Foreign Bodies in the Eye and Orbit by Means of Roentgen Rays.

DAVIDSON, MACKENZIE, M. B., AND COLLINS, TREACHER, London, England. (*British Medical Journal*, February 5, 1898. Report of the January meeting of the Royal Ophthalmic Society of the United Kingdom.) Mr. Mackenzie Davidson made a few introductory remarks as to the method of localization of foreign bodies by the Roentgen rays he had recently devised and fully described in the *British Medical Journal* of January 1, 1898. He then demonstrated the special application of the method for the detection, localization, and estimation of size of foreign bodies in the eyeball and orbit. The patient was seated upright, and his head fixed in a rectangular rest. The photographic plate was placed against the temple of the affected side behind cross wires. A lead wire was made to touch the edge of the lower lid opposite a known point on the eye, and the patient fixed his gaze on a distant object during the exposures. These were made in the same way as for other parts of the body, and the interpretation of the skiagraphs was carried out by the use of the "cross-thread localizer."

Mr. Treacher Collins then gave a description of four cases in which this method had been applied. In none of them could the presence of a foreign body be certainly determined from the clinical appearances. In two of the cases the chip of steel was subsequently withdrawn by the introduction of an electro-magnet in the direction in which it had been ascertained to lie. The size of one of these bits of steel was practically the same as had been estimated previous to its removal. In another case, the eye being quiet, and two months and a half having elapsed since the injury, operative procedure was not thought justifiable. In the remaining case, which was the first they had dealt with before they had obtained sufficient exper-

ience of the method, the foreign body was found to be in the orbit when they thought it was lodged in the eyeball. Mr. Collins also mentioned three cases where the presence of a foreign body in the eye was suspected in which they had by means of the X-rays been able to assure themselves none was there. In one of their patients, in whom a large number of exposures had been made, some loss of hair occurred a month afterward from the temple, which was directed nearest to the tube.

**Glaucoma and the Influence of Mydriatics and Myotics
Upon the Glaucomatous Eye.**

JACKSON, EDWARD, A. M., M. D., Philadelphia, Penn. (*American Journal of Medical Sciences*, April, 1898.) This interesting paper with numerous examples and references serves as the basis for the following conclusions: "With reference to the use of mydriatics, we are justified in saying: In general, they should not be applied to eyes that are glaucomatous or upon the verge of glaucoma. In such eyes the dilatation of the pupil they commonly produce is dangerous, and may cause increase of intraocular tension, which, if not speedily relieved, will do permanent damage. But the risk of this effect from a mydriatic is not to be guarded against by fixing an age limit before which mydriatics may be considered safe and after which they should not commonly be employed. In the great majority of eyes a mydriatic cannot cause glaucoma at any time of life, while on the other hand, a few patients are affected with the disease even from childhood. The danger is best guarded against by bearing in mind the symptoms of glaucoma and always looking for them before ordering a mydriatic, especially by a careful ophthalmoscopic examination.

In very rare cases careful examination may not reveal the imminence of glaucoma, yet when the mydriatic has been used the outbreak may occur. In such a case, the usual remedies for glaucoma should be promptly resorted to. The mydriatic should be stopped and iridectomy strongly urged. With the proper iridectomy promptly done, the prognosis for complete, permanent cure is excellent, the results being decidedly better than in cases dis-

covered at a later stage when the glaucomatous outbreak has occurred spontaneously. Indeed, if the patient permits the proper immediate treatment of his case, the fact that an outbreak of glaucema has been evoked by the use of a mydriatic is probably a cause for congratulation, rather than for regret. For the eye was in all probability, doomed to the disease, and the earlier the application of the remedy gives the better chance for complete and permanent cure.

I believe it would be perfectly proper, after explaining the matter to the patient, and getting his assent to prompt iridectomy, if it should be indicated, to use homatropine as a test for the presence of glaucoma at the earliest stage in doubtful cases.

If the patient refuses iridectomy, eserine should be promptly resorted to in such strength and with such frequency as may be necessary for the reduction of the pupil. In the case of a glaucomatous outbreak following the use of a mydriatic more persistent in its action than homatropine, it would be proper to shorten the period of mydriasis by tapping the cornea and evacuating the aqueous humor, preparatory to the efficient use of eserine.

In any case of glaucoma in which the pupil is firmly bound down by adhesions, or is otherwise so fixed that mydriasis cannot cause thickening of the iris opposite Fontana's space at the angle of the anterior chamber, especially if the application of eserine aggravates the symptoms, it is justifiable to apply atropin or some other mydriatic, and in a small proportion of cases such applications will be of marked benefit.

Myotics are beneficial in glaucoma only when the pupil is still movable; that is chiefly in the earlier stages. When not beneficial, they are usually distinctly injurious.

If for any reason iridectomy cannot be done, myotics are always to be tried in the earlier stage of the disease. If they cause marked improvement they may be continued so long as they keep the tension down; if they promptly relieve attacks they may be continued so long as the attacks are rendered less severe and frequent, and leave no permanent impairment of function, either of central vision or of the field, in the interval. But in the vast major-

ity of cases there will come a time when the influence of the myotic, although still favorable, is less favorable than it has been; and after this it is liable rapidly to lose its power to do any good at all. Hence, whenever this period arrives, the patient should be warned that the myotic is insufficient, practically worthless, and an operation, preferably iridectomy, gives the only chance for escaping complete blindness, and perhaps, intense suffering."

A Comparison of the Value of Local Medicinal Measures in the Treatment of Granular Conjunctivitis (Trachoma).

Being a portion of the report of the special committee appointed to discuss the subject of granular conjunctivitis (trachoma) for the Section on Ophthalmology of the American Medical Association, forty-eighth annual meeting held at Philadelphia, Pa., June 1 to 5, 1897. (*Journal of American Medical Association*, January 15, 1898.) Würdemann insists that, in order to discuss local applications scientifically, the diseased process should be considered. The alteration of the epithelium is the only constant anatomico-pathologic phenomenon, the stages of its destruction should be noted in the treatment of the various processes coming under the head of trachoma or granular conjunctivitis. These stages are:

First stage.—*Epithelial proliferation* with a catarrhal condition due to hyperplasia and increased function. Treatment is detergent and antiseptic.

Second stage.—*Superficial destruction of epithelial elements*, which may be reproduced by reorganization. Treatment applicable to this stage, removal of hyperplastic tissue, together with absorbent, stimulative and antiseptic measures.

Third stage.—*Total destruction of epithelium*. Treatment should consist in relief of sequelæ, complications and stimulation of remaining epithelium to aid in resorption of cicatricial tissue and regeneration of new epithelium.

Fourth stage.—The result of disease, *xerosis*, an incurable condition whose symptoms are relieved by emollients.

General, prophylactic, hygienic and constitutional measures are dwelled upon in a general way. The treatment is at first all directed toward removal of causes of destruction of epithelium. Later, to effect its regeneration.

He discusses the removal of hyperplastic tissue and products of inflammation, by mechanical and surgical means if necessary, and the relief of asthenopic symptoms, complications and sequelæ.

Under detergents and antiseptics, boric acid, bichlorid and cyanid of mercury are recommended in this order for the patient's own use. Stronger solutions, guarded by antipyrin, weak cocain, eucain or holocäin are gratefully born and useful. Ungt. hydrarg. oxid. flav. and ungt. ichthyol are considered stimulative as well as antiseptic.

Brushing with nitrat of silver, bichlorid, or lactic acid, causes considerable reaction; the first stains the conjunctiva if long continued. Argentamin, cyanid of mercury and boroglycerid are free from above objections. Tannat of quinin, antipyrin and resorcin in solution or dusted on conjunctiva are antiseptic. In acute inflammation, iced applications and cold bathing together with silver compounds are advocated. Congestion is limited by cocain, eucain or holocäin with boric acid or sodii biborat.

Under stimulants, hot water bathing, with or without antiseptics, and silver, mercury, copper and zinc compounds, not strong enough to corrode epithelium, are advised. Nutrition is increased by massage with ungt. hydrarg. oxid. flav. Stimulation of nutrition may be effected by massage with impalpable boric acid, iodoform, calomel or aristol. Application of pumice stone, instillation of crude petroleum, ichthyol, boric acid, resorcin and glyceride of tannin act as stimulants, as do also alum, copper, silver, lapis divinus and ammonium muriat. Jequirity in weak solution causes absorption by hyper-stimulation.

Myotics and mydriatics are advocated in the complications, such as pannus and ulcerative keratitis. Eserin acts as a stimulant, atropin as a sedative; scopolamin and duboisin may be substituted for the latter. Massage with mercuric ointments or stimulating powders are most beneficial for sequelæ, causing absorption of cicatrices and leucomata. Most applications are better borne if a weak local anesthetic is used first. The application of silver salts should be followed by solution of sodii chlorid or cocain, to prevent continued action. Strengths of drugs and methods of application are minutely described.

Würdemann lays special stress upon massage with *complete* eversion of the eyelids so that the folds of transmission are thoroughly exposed to view.

He considers that medical treatment, although tedious, is followed by gratifying results, but that in most cases it should be combined with surgical measures.

The Present Status of Jequrity in the Treatment of Trachoma.

CHEATHAM, WILLIAM, A. B., M. D., Louisville, Ky. (*Journal of American Medical Association*, January 15, 1898.) The writer is very enthusiastic in speaking of the use of this remedy in trachoma. He gives his personal experience with this treatment and claims that when used in picked cases, there is nothing that will take its place. He has used it in all cases excepting the acute with nothing but the best results; he has never seen an ulcer of the cornea following its application, although he has seen xerosis, but no case in which he could say positively that the condition depended upon the use of the remedy. He uses powdered jequirity, dusting some in the eye once or twice, and in cases of trachoma with pannus, he sees results follow the use of this procedure which he thinks cannot be accomplished by any other means. He cites a number of instances of the favorable action of this remedy.

"Such cases are common in my experience. I see so many less cases now in which jequirity is indicated than I used to, because trachoma, I think, is recognized earlier and treated more intelligently. Very weak infusions of jequirity are often of much benefit. But I most frequently use the powder; severe reaction is much less frequent, the application can be better confined and the powder does not degenerate with time. The powdered jequirity which I now use has been made for some years, and is as active today as when fresh. I have used jequirity in all stages of trachoma except the acute, with and without pannus, with none but favorable results. I am more careful now in the selection of my cases than formerly, yet I would not hesitate to use it in any case in which other methods had failed me. In select cases of trachoma with pannus, I know of nothing that will take its place. Gentlemen who

have had one or two unfortunate results from its use, should try it again. I am sure they will be pleased with it if properly used, in the form of a powder, in selected cases. In some cases it is with me the last resort, in others it is the first."

Epithelial Xerosis of the Conjunctiva.

STEPHENSON, SYDNEY, M. B., London, England. (*The Lancet*, February 5, 1893. Report of January meeting of the Ophthalmological Society of the United Kingdom.)

Mr. Sydney Stephenson made a communication upon this ailment, which he said was not uncommon in England, since among 6,209 children he found no fewer than 1.87 per cent. affected. At particular places the examples of xerosis ranged from 0.66 per cent. to 9.47 per cent. After describing the appearances and bacteriology of the affection, the author passed on to consider its relationship to night-blindness, which he regarded as something more than merely accidental. He pointed out that xerosis, in the absence of hemeralopia, was supposed to give rise to no symptoms beyond such as were presented by the conjunctiva. He had found, however, changes in the visual field—namely, (a) a reduction in size and a transposition of the red and green fields, and (b) a slight contraction in the limits of the field for white. The former was constant, the latter not always present. The retinal reflexes in these cases appeared to be exaggerated. Mr. Stephens concluded that every eye with epithelial xerosis was in a state of torpor retinæ. In discussing the causes of xerosis he laid stress on two factors—first, lowered nutrition, and, secondly, dazzling by bright light. Most of his patients suffered from otorrhea, hypertrophied tonsils, peripheral vascular opacities of the cornea, relapsing pustular eruptions of the face or scalp, or other signs of "scrofula" or tubercle. Hemoglobin, according to Mr. Stephens, was always reduced in amount, averaging in his cases of xerosis 65 per cent. of the normal, as tested by Gower's hemoglobinometer. As the conjunctival changes disappeared the proportion of hemoglobin rose, but never to normal. This led him to inquire whether among children it was always below par. In conjunction with Mr. G.

C. Burton he examined 164 healthy children, with the result that it was found to vary from 65 per cent. to 95 per cent., and to average 76.62 per cent. of the normal. Mr. Stephens further claimed that in xerosis the red blood cells were sometimes reduced in number. As to treatment, he strongly recommended iron, preferably in the form of Blaud's pill. He quoted a number of cases, and illustrated his paper by cultivations and microscopical preparations of the xerosis bacillus.

A Preliminary Communication on the Value of Salicylic Acid Ointment in the Treatment of "Spring Catarrh."

RANDOLPH, ROBERT C., M. D., of Baltimore, Md. (*British Medical Journal*, January 8, 1898.) The writer has used salicylic acid in the form of an ointment in treating three cases of "spring catarrh" with much better results than followed the use of any of the various remedies which have been advocated from time for this stubborn affection. He gives the histories of three cases thus treated, two cases having been of the ocular variety of the disease, and the third of the palpebral form. In the former cases, salicylic acid was used in the strength of six to ten grains to the ounce of lanolin, a little of the ointment being placed between the lids once a day and pressure with rubbing advised over the upper lid for about a minute, so as to thoroughly apply the remedy; with this a few drops of a solution of salicylate of sodium, ten grains to the ounce of water were instilled three times a day. In the one example of the palpebral form, the lids were everted and some of the ointment thoroughly rubbed into the granulations by means of cotton upon the end of a toothpick. In this case the ointment was increased in strength from week to week until finally seventy-five grains to the ounce of lanolin were employed.

Where the changes were confined to the eyeball, six to eight grains of salicylic acid to the ounce of lanolin seemed adequate to dissipate the symptoms, but in the palpebral form the increased strength described above had to be used before there was any improvement. Even in the strength of six grains to the ounce, this ointment relieved the itching and burning. Patients always complain of the

first few applications, and when the stronger forms are used it is necessary to employ cocain. "Salicylic acid ointment has been used very extensively by dermatologists in recent years, and I have been told that it is very valuable, particularly in chronic eczema. We have in spring catarrh an affection which is not entirely different from the chronic form of eczema. It certainly promises a great deal."

Note on Protargol in Ophthalmic Practice.

ALT, ADOLF, M. D., St. Louis, Mo. (*American Journal of Ophthalmology*, January, 1898.) The writer's information concerning the nature of protargol is derived from an article by Neisser: This new silver-salt contains 8.3 per cent. of silver (argent. nitr. 6.35 per cent.; argonin 4.2 per cent.; argentamin 10 per cent.) It is a chemical combination of silver with a proteine substance, and forms a yellowish fine powder which dissolves readily in hot or cold water. Its most important peculiarity, not shared by any other silver salt, is that from the aqueous solution it is not precipitated by either albumen, diluted chloride of sodium, diluted muriatic acid, or caustic soda. These characteristics give this salt as great a facility of penetrating action on the tissues as no other silver salt enjoys. It is superior to argentamin, which otherwise is the best silver salt. in that in solutions of $\frac{1}{4}$, $\frac{1}{2}$ and 1 per cent., it causes but an extremely small amount of irritation.

"The results which Neisser had reached by using this new silver-salt in treating inflammation of the urethral mucous membrane, and particularly the statement, that it produces almost no irritation while being as effective and more so than silver-nitrate, on account of its penetration into the depths of the tissues, prompted me to give protargol a trial in the treatment of all forms of conjunctival inflammation in which I had thus far applied silver-nitrat.

"While I am now, after two months trial, not trying to praise protargol as a panacea for all conjunctival inflammations, I am so impressed and pleased with its beneficial and almost painless action on the conjunctiva, that I want to draw the attention of my confreres to this new silver-salt, protargol, as early as possible.

"As far as my experience goes, it acts as well as silver nitrat, sometimes, indeed, in cases of acute conjunctivitis, I am satisfied it acted quicker than the old favorite.

"I have used it thus far only in a 1 per cent. solution. In this strength it causes no noticeable inconvenience to the patients, who, on that account, greatly prefer it to the silver nitrat.

"It would be tiresome to relate individual cases here; it may suffice to repeat, that wherever silver nitrat is indicated, it is well to give protargol a trial instead, and I have no doubt that in a great many cases, if not in all, the results will be gratifying."

Hemianopia, with Especial Reference to Its Transient Varieties.

V
HARRIS, WILFRED, M. D., M. R. C. P. L., London. (*Brain*, Part LXXIX., Autumn 1897.) The writer deals with his subject under the following headings: (1) Bi-temporal hemianopia; (2) bi-nasal hemianopia; (3) hemianopia in hysteria; (4) homonymous hemianopia; (5) quadrantic hemianopia; (6) color hemianopia; (7) hemianopic hallucinations; (8) hemianopia commencing with blindness; (9) central incomplete hemianopia; (10) double hemianopia; (11) cortical representation of the macula; (12) transient hemianopia.

The article is a lengthy, but very interesting and important contribution. It was originally intended to deal with several extraordinary cases of transient hemianopia, associated with unilateral convulsions, the disturbance of vision often lasting twenty-four hours or more, such cases going far to prove a theory of cortical representation of the macula, and that the macular region of the retina is really innervated on the same plan as the rest of the retina. He was led to extend the original title of his paper by the close analogy which such cases bear to epilepsy on the one hand, and migraine on the other, and by the association of hallucinations in the blind field with hemianopia, and other points of interest.

Dr. Harris discusses the various forms of hemianopia enumerated above at considerable length, giving numer-

ous references and many illustrations. His conclusions are:

1. Hemianopia rarely binasal, more commonly lateral and left-sided, with accompanying constriction of the remaining half-fields, may occur as a temporary phenomenon in hysteria.

2. Hemianopia due to a vascular lesion of the cuneus, of sudden onset, may commence with marked loss of sight, sometimes amounting to complete amaurosis, and due probably to inhibition of the remaining half-vision center.

3. The cortical half-vision centers are not sub-divided into centers for light, form, and color respectively, and hemiachromatopsia may be due to a lesion anywhere in the visual path between the chiasma and the cortex.

4. Quadrantic hemianopia, though strongly suggestive of a cortical lesion, may sometimes be due to a lesion of the internal capsule.

5. The macular region of the retina is invariably supplied with the nerve fibers on the same plan as the rest of the retina, *i. e.*, each side of it from the corresponding side of the brain. In all cases of absolute transient hemianopia the dividing line between the seeing and the blind halves invariably passes through the fixation point.

6. The cortical center for the macular region in each cuneus is less liable to complete destruction, and recovers earlier than the rest of the half-vision center.

7. Cases of persistent hemianopia in which the dividing line passes to one side of the fixation point, leaving it in the second half, are to be accounted for either (a) by the escape or partial recovery of the cortical center for the macula, or (b) by the acquirement by education of a new fixation point in the retina.

8. Hemianopic visual spectra of low elaboration, such as red or green lights, or the varieties of scintillating scotoma in migraine, are caused by a discharge in the half-vision center in the cuneus.

9. Complex visual phenomena of hemianopic type, such as faces, animals, etc., are elaborated in a still higher visual center, which possibly is the angular gyrus; their occurrence in the half-field only being due to reflex irritation from a lesion generally in or near the cuneus, but which may be in the optic radiations or optic tract.

10. Double hemianopia does not necessarily cause permanent amaurosis, in many cases the return of a small area of central vision indicating the escape or recovery of the cortical center for the macula in the cuneus on each side.

11. The hemianopia in migraine is due to an epileptic discharge in the half-vision center of one side.

12. In many cases an epileptic discharge may originate in, or near, the half-vision center on one side, in some cases proceeding no further, beyond producing temporary hemianopia, in others producing a typical epileptic fit, and again in others giving rise to unilateral convulsions without loss of consciousness.

13. Transient hemianopia in such attacks may last for 24 hours or longer, and may be due to vascular softening adjacent to, but not involving the visual center or path.

14. Transient hemianopia is rare in ordinary Jacksonian epilepsy, and is not liable to occur unless the half-vision center be (1) already slightly damaged, or (2) hypersensitive and prone to spontaneous discharge, as in migraine.

15. Such transient hemianopia not unfrequently accompanies unilateral convulsions in general paralysis, and may possibly occur in uremia.

16. The auditory center may be similarly paralyzed through spread of the epileptic discharge.

Henschen has recently published a case of quadrantic hemianopia, the lower quadrants of the field being blind, due to a hemorrhagic cyst in the posterior part of the pulvinar, which had destroyed the dorsal half of the external geniculate body, but left intact the optic tract and optic radiations, and he infers that the dorsal half of the external geniculate body corresponds to the upper quadrants of the retinae, just as, in his opinion, the upper lip of the calcarine fissure corresponds to the same quadrants of the retinae.

The Fluttering Produced by the Juxtaposition of Certain Colors, and of Black and White.

HOLDEN, WARD A., M. D., of New York. (*Archives of Ophthalm.*, Jan., 1898.) The writer gives the results of a number of experiments with colors and black and white,

and finds that his results agree more nearly with the views of Szili than with those of the other authors who have written on this subject. A number of interesting color phenomena are alluded to under the headings: "Luminosity, Effects of Viewing a Colored Object on Backgrounds of the Same or of Different Luminosity;" "Luminosity and the Perception of Relief;" "Luminosity and the Perception of Form;" "Luminosity and the Perception of Apparent Motion;" "Fluttering, the Luminosity of After-Images;" "The Color Combination of After-Images," and "The Fluttering of Black Figures on a White Ground."

In the last paragraph he speaks briefly of the elements which make for legibility in the printed page, a subject, he says, which was treated of in detail by Javal twenty years ago, and later by Cohn and others. He concludes with the following resumé:

"When two colors of nearly equal luminosity are juxtaposed, one color will seem to dart over the other color, and the margin between them will appear constantly to shift as the eyes or the colors are moved. This fluttering is due to the negative after-images of each color being projected upon the other color; and it is seen best when the two colors are nearly equal in luminosity, because an after-image of an object arises most readily when surrounding objects are of the same luminosity, and also because after-images are perceived most readily when projected on a ground of the same luminosity. An after-image of short duration gives rise to an appearance of flashing. An after-image of longer duration, projected on a background of nearly the same color, intensifies that color and gives rise to an appearance of glowing. The after-images appearing and fading away, and shifting with every movement, give rise to the appearance of fluttering.

"Different colors on a dark ground appear to stand out in different degrees of relief, and this has been confounded by some authors with the phenomena of fluttering. But apparent relief is entirely independent of hue, and depends solely upon relations of luminosity; it being greater, the greater the difference in luminosity between object and background, while fluttering is most apparent when the difference in luminosity is least.

"Black on a pure white ground readily gives rise to white after-images, which cause either flashing or glowing according to their duration, and black objects on white thus appear to flutter, as do juxtaposed colors of equal luminosity. Such after-images arising from the cumulative fatigue of the retina in reading successive lines of print give rise to much of the discomfort experienced in reading badly printed pages, and the printer's aim should be to compose a page in which the disturbing effects of these after-images are reduced to a minimum."

Eye-Strain.

CHENEY, FREDERICK C., M. D., of Boston, Mass. (*Boston Med. and Surg. Jour.*, Feb. 17, 1898.) The writer alludes to the importance of eye-strain as an etiological factor in the various forms of functional headache, now so well recognized, both by the medical profession and the laity, enumerates the varying peculiarities of such ocular headaches, and the many symptoms of eye-strain in general. He calls especial attention to two conditions, which are not sufficiently known, as being caused by eye-strain—*vertigo* and *drowsiness*.

He mentions the fact that vertigo is produced most frequently by some systemic disorder, but he recites examples in which this symptom depended upon eye-strain and disappeared after proper glasses had been prescribed. While he does not credit errors of refraction with being frequent causes of drowsiness, he mentions the fact that such a connection is not uncommon, and relates cases in which such drowsiness, especially upon application for near work, was removed by correcting lenses. Examples are also added showing that in some cases at least, "that tired feeling" with which so many are afflicted is dependent upon eye-strain.

Amblyopia From Suppression, Congenital Imperfection, or Disease.—Which, or All?

CONNOR LEARTUS, A. M., M. D., of Detroit, Mich. (*Journal of Amer. Med. Assn.*, Jan. 22, 1898.) Dr. Connor states that different writers use the term "amblyopia exanopsia,"

to express radically diverse ideas; he starts out, therefore, by defining its meaning. He mentions the three views regarding the nature and causes of the diminished vision; the first, that the brain actively inhibits the visual center from receiving impressions, until it loses its receptive power in whole or part; the second, that the brain or visual center was not properly constructed; the third, that the phenomena result from disease. He regards the relative importance of these views as important, and as having a direct and serious bearing upon the question of the treatment or management of such cases.

To determine what light clinical evidence would throw upon this subject, Dr. Connor examined 7,500 recorded cases of imperfect vision from private practice, using the inability to see 20/40 or more after correction, as the standard for amblyopia. Four thousand of these were anisometropic, but only 60 were amblyopic; hence, anisometropia, a frequent condition in convergent squint, could not be an important factor in causing amblyopia in squint cases. He gives figures tending to show that the majority of amblyopes do not squint—evidence weighing strongly against squint as a cause of amblyopia.

He alludes to the suppression view that hyperopia causes confused images which induce the brain to inhibit the visual centers, and thus cause amblyopia; but, since but few hyperopes squint, and very few are amblyopic, he believes this theory untenable. "Incidentally the facts seem to show that lack of muscular equilibrium; rather than either hyperopia or imperfection of the visual centers, is the essential factor in causing squint.

"In common with others I have found that the normal power of the internal rectus as compared to that of the external is as four to one. If this be changed we have convergent or divergent squint, according to the refractive defect; if it remain unchanged, there is no squint."

As additional evidence against squint causing amblyopia he says he has been unable to find a single case with central scotoma in which vision was materially improved by operation, exercise, or the correction of refractive defects. He refers to the claim that cases of scotoma, like those found in squinting eyes, are unknown; his records show

20 such cases who never squinted; these were due to congenital defect.

He calls attention to a class of cases often confounded with true amblyopia, in which vision is more or less diminished without scotoma, and which improve under appropriate management. The improved vision in these cases, he believes to be due to "disuse more or less complete from a variety of causes, as refractive defects, lack of muscular balance, from constitutional disease, overwork, etc." He alludes to the cases reported of speedy cure of the amblyopia of a squinting eye, after the destruction of its fellow, and adds one of his own in which there was no such improvement under like circumstances. In the former cases the amblyopia from disease develops its latent power when the necessity for the same present, in his own case, there being no latent power because of congenital defect, the eye remained blind.

Dr. Connor adds the follow conclusions:

1. "There are undoubted cases of amblyopia from congenital imperfection, characterized by central scotoma, and being unaffected by any treatment; they are found in eyes that squint and eyes that do not squint, in the hyperopic, astigmatic, and anisometropic, and in eyes free from one or more of these defects.

2. "There is no positive evidence of the existence of amblyopia from suppression, viz., a loss of sight from the inhibitory action of the brain upon the visual center.

3. "There is a class of cases often confounded with amblyopia, characterized by lack of persistent vision, rather than absolute loss; by the absence of scotoma, improved often by proper management, is never congenital; found in all varieties of refraction, and all sorts of muscular disturbance; having the same nature as diminished functional power of any sound organ from non-use or diminished use.

4. "There is a class of cases in which a congenital amblyopia is still further crippled by disuse; in these, proper management often produces satisfactory results in removing the latter factor.

5. "It, therefore, remains good practice to study every case of amblyopia, with or without squint, at the earliest

possible moment, correct its refractive defects and restore its muscular equilibrium, because, while we cannot repair the congenital imperfection, we may remove the disability from disuse and thus secure some improvement of vision."

An Historical Review and Criticism of the Bacteriological History of Trachoma, with Personal Observations on Fifteen Cases.

LAWSON, ARNOLD, F. R. C. S. (Eng.) London. (The Royal London Ophthalmic Hospital Reports, Dec. 1897.) There is probably no disease which has given rise to so much discussion amongst those who are interested in the bacteriology of the eye as trachoma. The specific origin of this disease has been the subject of numerous papers from the pens of continental and American observers, but English ophthalmologists have, up to the present time, contributed very little to the literature of this affection; probably because the disease does not hold the same prominent position in this country as in many others.

I have, therefore, thought that it might be of interest to give a short historical review of the published researches into the bacteriology of this disease before proceeding to any personal observations of my own upon the matter.

The first published observations on the microbial origin of trachoma came from Hirschberg and Kraus (*Centralbl. f. prakt. Augenhkde.*), in the year 1881. These authors announced that they had discovered club-shaped microorganisms in the secretion obtained during the acute stages of trachoma, but had failed to find them in the chronic stages of the disease. During the same year Sattler read his first paper on the subject before the congress at Heidelberg, when he stated that he had isolated a special micro-coccus from the lids of patients affected with trachoma. These micrococci were circular in shape and most usually united in series of threes or fours, but never appeared in chains as streptococci, nor in large masses as staphylococci. They were also motile. With inoculations of pure cultures of this micrococcus, Sattler claimed to have succeeded in producing trachoma in man, but had failed in all attempts to transmit the disease to animals.

In 1882 Sattler read a second paper on the subject before the Ophthalmological Society of Heidelberg. He had made further extended researches, and described a case in which he said he had successfully produced trachoma by inoculating a culture of his micrococcus into the conjunctiva of a little girl. No histological examination had, however, been made of the patient's conjunctiva, so that positive proof of his success was lacking.

Two years later, 1884, found Koch in Egypt studying the origin of cholera, and whilst thus engaged he also undertook some researches into the origin of Egyptian ophthalmia. He found many varieties of micro-organisms, and isolated, amongst others, a bacillus analogous with that of mouse septicemia. This bacillus is apparently identical with that described later by Kartulis and Weeks, known now as the Weeks-Koch bacillus. This bacillus is now generally believed to be the specific organism in "pink-eye," or acute catarrhal conjunctivitis.

In 1885, Raehlmann, in a treatise on trachoma (*Samml. klinisch. Vort. heraus. v. Volkmann, Leipzig, 1885,*) announced that he had isolated small round micrococci, and Poncet (*Gaz. des. Hop., 1886,*) in the following year also succeeded in isolating a definite micrococcus.

During this year (1886) Michel published in the *Archiv f. Augenheilkunde* the results of his extensive researches as to the specific origin of Egyptian ophthalmia. Michel's conclusions may be shortly summarized as follows: 1. The definite, specific micro-organism of trachoma is a micrococcus which should be sought for in the trachoma follicles themselves, and not in the conjunctival secretions. 2 Morphologically this micrococcus, which he styles the trachoma-coccus, is a diplococcus, very small in size and biscuit-shaped. The dividing line is very narrow. 3. Biologically it is non-motile, but exhibits marked rotary and oscillatory vibrations. It is strictly aerobic. It grows slowly and scantily on nutrient gelatin which is *non-liquified*. On agar-agar and blood serum at blood heat the growth is rapid and abundant, and spreads like a white cloud. In consistence it is viscid, adhering to the platinum needle. On potato the growth is very scanty. 4. True trachoma is induced by inoculation of pure cul-

tures of this micro-organism into the human conjunctiva.

Logetchnikow (*Trav. de la Soc. Phys. Med. de Moscou*, 1886,) has endeavored to discredit these researches of Michel by stating that the latter mistook an epidemic of follicular conjunctivitis for true trachoma.

In 1887 Koucherski (*Centr. f. prakt. Augenh.*, 1887,) published the results of his labors. He made separate examinations of the conjunctival discharge and of the trachomatous follicle. In the former he encountered varieties of micrococci and bacilli either associated together or as pure growths. In the trachomatous follicles he discovered small diplo-cocci, which he styled "trachoma cocci." These cocci liquified gelatin, and microscopically resembled the gonococci of Neisser. The author inoculated various animals, rabbits, pigeons, dogs, cats, etc., with pure cultures of the organism, and met with no success, and was equally unsuccessful in five cases where he endeavored to induce trachoma in man.

The next article on the subject was a thesis written by Schmidt for his degree of doctor of medicine. The writer drew distinction between the coccus described by Sattler and that described by Michel, giving it as his opinion that Michel's coccus was the microbe of acute blennorrhoea, or of trachoma complicated by acute blennorrhoea. He himself had isolated a micro-coccus much resembling the *staphylococcus pyogenes*, much larger, less motile, and liquifying gelatin less quickly. This coccus appeared to be identical with that described by Sattler. He further claimed to have succeeded in inducing trachoma in birds and animals, although repeated inoculations were required in the case of mammals before he met with success.

In 1888, Staderini (*Ann. d' Ocul.*, XCIX,) succeeded in isolating a diplococcus resembling the gonococcus, but smaller. He inoculated the micro-organism into animals which were kept in unsuitable and unhealthy surroundings with a view to form a predisposition to disease. He came to the following conclusions: Inoculations of the diplococcus into the conjunctival sacs of rabbits gave rise to a trachomatous conjunctivitis in those animals which were badly nourished and crowded together, whilst the result was negative in those rabbits that were well fed and had

plenty of air and space. The author went on to say that the follicles of trachoma were due to the irritation set up by micro-organisms, the process being accompanied by an exudation of leucocytes.

The above paper was followed shortly afterward by an article by Petresco, of Bucharest, (*Ann. d' Ocul.*, XCIX,) in which the author stated that besides many varieties of cocci and bacilli, he had isolated a special micrococcus, to the presence of which he attached considerable importance. This micrococcus differed from Michel's coccus, in the fact that it liquified gelatin. It could be distinguished from the gonococcus of Neisser by staining well by Gram's method, and from the coccus described by Poncet in 1886, in being found in the trachomatous follicles, and not only in the conjunctival discharge. All the author's efforts, however, to induce trachoma in animals were unsuccessful.

During the next year (1889) Reid, in a paper read before the Ophthalmological Society of the United Kingdom, declared his inability to find any special micro-organism whatever in trachoma.

In 1890 the question of the origin of trachoma was discussed at the Ophthalmological Section of the International Congress, held at Berlin. Raehlmann, Schmidt-Rimpler, Swan-Burnett, Sattler and Chibret took part in the discussion, and while all these authorities were unanimous in recognizing an undoubted infective process in trachoma, not one investigator could secure universal approval of the specific nature of any one particular microbe. During this same year Shongolowitch wrote a thesis on the subject for his degree of doctor of medicine. He stated that he had succeeded in inducing a granular conjunctivitis in rabbits and cats by inoculation of pure cultures of a particular bacillus, which he had succeeded in isolating from the contents of trachomatous follicles. The bacillus was characterized by its small size, its slenderness, and by its imperviousness to ordinary strains.

A fresh impetus was given to the question next year, 1891, by an article by Noisewski (*Archiv. f. Augenh.*, 1891), who brought forward an entirely new specific agent for trachoma in the shape of a bacterium closely allied to the "microsporon furfur of Kaposi." To this he gave the

"microsporon trachomatosum." Noisewski absolutely denied the specific nature of any of the micro-organisms described by other writers, and declared that true trachoma had resulted in four or five weeks after inoculation of his "microsporon trachomatosum" into the conjunctival sacs of rabbits.

In the latter half of the same year a paper appeared in the *Ophthalmic Record*, in which the author (Fulton) expresses his belief in the specific nature of Michel's micrococcus.

The advancement of all these varied organisms, to each of which a specific nature had been so readily ascribed by its enthusiastic discoverer, naturally enough led to a reaction in thought, and Muttermilch, in 1893 (*Ann. d' Ocul.*, CIX), wrote a paper on "The Nature of Trachoma," the sum of which amounted to a total denial of the contagious character of acute trachoma.

He was followed by Guenod (*Gaz. des Hopitaux*, 1894), who expressed doubt as to the existence of a special micro-organism in trachoma. "Although," he says, "the contagious character of the granulations is supported by weighty arguments, one cannot help thinking that trachoma, having regard to the strict localization of the disease in lymphoid tissue, has an endogenous origin."

Fuchs now enters into the controversy, and during this same year (1894,) he published his opinion on the subject in his textbook on ophthalmology. It may be summarized as follows; The ultimate origin of the disease is probably gonococcus. The gonococcus transferred to the conjunctiva causes an acute gonorrheal ophthalmia, and when this becomes chronic a similar transference of the infective material gives rise to trachoma.

This opinion of the gonorrheal origin of trachoma is shared by Hoor, who wrote a paper to this effect during the following year (1895).

A strong supporter of Muttermilch's views came forward this year (1895,) in the person of Gunning (*Genesek Tyds-sler*, 1895). This author expresses his disbelief in the contagiousness of trachoma. He says that there is no mucous or purulent secretion peculiar to trachoma; the presence of such secretion indicating the presence of complications, either acute catarrhal or purulent conjunc-

tivitis. The proofs of the non-contagiousness of trachoma lie (1) in the fact that it is frequently confined to one eye, and (2) that the inoculation of the discharge from trachomatous eyes produce only a catarrhal inflammation, and not trachoma.

On the other hand, Van Millingen (*Ann. d'Ocul.* CXIV, 1895), published about the same time the results of exclusive researches that he had made on the subject, and he is strongly of the opinion that trachoma is both infectious and contagious.

Lastly, in the following year (1896), an admirable thesis written by Cazalis for his "doctorat," at the University of Montpellier, brings us to the most recent extended investigations on the subject. To this thesis—which is not in general circulation, and so not easily obtainable—I am indebted for much valuable information in compiling this short historical review. It will be interesting to give a few notes on the results of Cazalis' work.

Cazalis isolated from cases of trachoma three varieties of bacilli: (1) Koch-Weeks bacillus; (2) clubbed-shaped bacillus, frequently found associated with the Koch-Weeks bacillus, and probably identical with the pseudo-diphtheritic bacillus; (3) a bacillus characterized by bipolar staining and by being decolorized by Gram's method.

Inoculations of pure cultures of bacilli (Nos. 2 and 3) into the conjunctival sacs of animals set up a mucopurulent conjunctivitis, with severe reaction, and accompanied by temporary enlargement of the conjunctival follicles.

Cazalis further isolated and experimented with a streptothrix (*streptothrix Foersterii*), which he encountered associated with a micrococcus, but he met with no positive results.

As regards micrococci, Cazalis isolated the gonococcus in one case, and frequently found staphylococci and streptococci. He also succeeded in obtaining pure cultures of Sattler-Michel micrococcus in two cases. This latter micrococcus he found in the conjunctival secretions, on the surface of the conjunctiva, and in the substance of the trachomatous follicles. He experimented with this micro-organism in animals, but in all cases his results were negative.

Cazalis concludes his personal observations by confessing his inability to assign a specific nature to any particular organism. Since Cazalis' paper, Uhthoff has published, during the last months of 1897, a monograph upon the bacteriology of conjunctivitis, and in speaking of trachoma he expresses his firm belief in the existence of some special specific organism which at present is unknown.

Observations on Personal Researches.—The subjoined notes relate to the results of the bacteriological examination of 15 cases of acute trachoma. They are simply intended as a preliminary record of an investigation into the subject upon which I have been engaged for some time past at the British Institute of Preventative Medicine, and do not pretend to any authoritative or dogmatic statements. I venture to relate them as a personal addition to this short paper. I take this opportunity to tender my best thanks to the Institution of Preventative Medicine for the great facilities offered me, and to Dr. Alan Macfayden and Dr. W. Hewlett, the director and assistant bacteriologist, for their most kind and able assistance.

I primarily undertook this investigation to endeavor to find out in what percentage of cases of acute trachoma the Sattler-Michel micrococcus would be found; and for this purpose I determined to compare cases of Egyptian trachoma with cases met with in this country. Whilst engaged on this I also paid attention to any other organisms encountered.

Mr. Kenneth Scott, of Cairo, most kindly sent me over from Egypt twelve agar-agar tubes, inoculated with the follicles of twelve cases of Egyptian trachoma, upon which he had operated by expression of the follicles. A series of agar-agar plates were made from the tubes on arrival, and the various colonies examined and transferred on to other media. Three of the tubes were spoiled on transmission, so that I have only records of nine out of the twelve cases.

The remaining six cases were obtained from the ordinary practice from Moorfields by the kindness of some of the staff. Much the same methods were employed as in the Egyptian cases, viz., the follicles were expressed, and

then agar plates and peptone broth inoculations were made. From these again, fresh inoculations were made on to other media. All the fifteen cases suffered from what is generally known as acute trachoma, that is to say, the disease was recent, the lids covered by abundant red fleshy granulations; there was an accompanying mucopurulent discharge, and the subjective symptoms were well pronounced.

As regard the Sattler-Michel micrococcus, I have only been successful in isolating it definitely in two cases, both of which occurred at Moorfields. In one of the Egyptian cases it was apparently found, but in spite of every care an absolutely pure culture could not be obtained. In both of the English cases also, in which it was isolated in pure culture, much difficulty was experienced. I should like at this point to enter a protest against this micro-organism being termed a diplococcus. It was puzzling to find that a micrococcus which, in its biological character, bore out everything that was described as peculiar to the Sattler-Michel coccus, to have, when grown on agar-agar or on blood serum, very definite grouping like a staphylococcus, from which it could not be discriminated. Cultures in peptone broth or on gelatin did, however, show distinct grouping of the coccus in twos and fours. To clear the point up Dr. Macfayden most kindly obtained a pure culture of the coccus from Prof. Sattler's laboratory, and, on comparing growths from this tube with my own, I found the same picture present; that is to say, that upon agar-agar and blood serum the coccus was arranged in masses like any staphylococcus, there being only occasionally diplococci to be seen, as always occurs in detached fragments of a mass of staphylococci.

Varieties of staphylococci were found in every case, either the *staphylococcus pyogenes aureus*, which was present in two cases, or the *staphylococcus pyogenes albus*. In one or two cases the *staphylococcus epidermidis albus* was thought to be found. This micro-organism only differs from the *staphylococcus pyogenes albus* in liquifying gelatin rather less speedily. Sarcinæ were found in two cases. Bacilli were found in five cases.

One variety of bacillus encountered was a non-motile

bacillus, decolored by Gram's method of staining. Nutrient gelatin was not liquified; and gave a plentiful white semiluculent growth. On agar-agar there was produced a uniform dull white cloud-like film, and a very similar growth was obtained on serum. On potato a thick white creamy, though not very abundant growth, resulted, and inoculation of milk did not cause coagulation. Inoculation of a pure culture of this bacillus into the conjunctival sac of a rabbit produced a severe reaction, and a fairly profuse muco-purulent discharge; whilst the conjunctival surface became speedily covered with red velvety granulations. The whole process had subsided in about a fortnight, at the end of which period the conjunctiva had regained its normal appearance and all the discharge has ceased.

The bacillus mesentericus vulgaris was isolated from another case; but, of course, this bacillus has no pathological significance. The other varieties of bacilli were not, unfortunately, followed up to a precise identification. One was a chromogenic bacillus, which yields an abundant smooth yellow growth on agar-agar and serum, whilst nutrient gelatin was not liquified, and only showed a very feeble growth. Each of these varieties of bacilli only occurred in one case, and in putting the cultures aside to be able to recognize any second appearance of the same bacilli in another case, the growth was allowed to die out.

Thus, so far, no variety of micro-organism, with the exception of staphylococci, has been found present in more than two out of the fifteen cases. Varieties of staphylococci were found in all cases. It is one of the essential characteristics of any micro-organism, for which a definite specific nature is claimed, that it should be found in all well marked and acute cases of the disease in question, and, as far as my experience goes, the Sattler-Michel coccus is very far from fulfilling this condition.

In short, I have been unable to discover any micro-organism without reference to any pathogenic properties it may possess, the mere presence of which may be regarded as a characteristic *microscopical* feature of trachoma. As I have, however, pointed out, my investigations into this subject are at present incomplete.

General Conclusions.—Three questions naturally suggest themselves on studying the combined results of the numerous writers on the bacteriology of trachoma:

1. Has trachoma a bacteriological origin or not?
2. Has any micro-organism been isolated which may claim to be the etiological factor of the disease?
3. Is it possible that trachoma is induced by a variety of micro-organisms rather than by one definite microbe?

I. Has Trachoma a Bacteriological Origin or Not?

On this point the mass of evidence is largely in favor of a bacterial origin for trachoma, and despite the arguments evinced by Muttermilch and Gunning to the contrary, such an opinion seems almost conclusively proved. The question chiefly turns on the contagiousness or otherwise of the disease. I say chiefly, because we have still to contend with the possible advent of a specific protozoon, though up to the present time all attempts to prove the existence of such a parasite have failed. The evidence of repeated epidemics of trachoma, and of cases where the disease has spread directly from one person to another of a community, are too numerous and well assured to admit of doubt. In all probability the contagiousness of the disease is very variable, being, under certain conditions, much greater at one time than at another. Thus, the disease may assume an acute epidemic form when it appears to be highly contagious, while at other times it makes its appearance in isolated chronic cases, lacking the acute symptoms of the epidemic form. In this latter manifestation the conditions favorable for the spread of the disease do not seem to exist, and the power of transmission is much lessened. In such cases only one eye may be affected, though this is rare, and the second eye usually becomes implicated at some later period. The conditions which chiefly influence the contagious character of the disease have been shown to exist in bad hygienic surroundings; and in this respect trachoma does not differ from many well known and undisputably contagious diseases such as diphtheria and typhoid, plague and cholera. Mr. Ridley, in an interesting paper on the histology of trachoma (*Trans. Ophth. Soc., U. K., 1894*), gives four arguments against the bacteriological origin of trachoma.

As, in these four arguments, Mr. Ridley sums up the points that have been most generally adduced against the bacterial theory, I venture to offer a few words of criticism in reply.

He quotes, firstly, the great diversity of opinions as to the etiology of the disease, "that many micro-organisms have been found, that to many a specific nature has been assigned; but in all cases conclusive proofs have been wanting. On the other hand, equally competent observers have found no special micro-organisms."

As regards this point, it must be remembered, that one great difficulty in discovering a specific microbe lies in the resistance offered by animals to the disease. Trachoma, as far as one can judge, is a disease peculiar to man; moreover, the presence of a multiplicity of bacteria is by no means a conclusive proof of the absence of a specific bacterial process, a point to which I shall point later.

Secondly, Mr. Ridley suggests that a parasitic protozoon may be the etiological factor. The importance of parasitic protozoa in the causation of disease is now becoming widely recognized, and a parasite has been definitely proved to be the specific cause of malaria; but the presence of a protozoon of this description in trachoma is, after all, only hypothetical, and the mere possibility of its presence can hardly be used as an argument against the bacterial theory in a disease where bacteria actually abound.

With reference to the possibility of a parasitic origin in trachoma, Mr. Ridley states that "bacterial diseases are usually more easily communicable, whilst those due to protozoa vary in the extreme." This is a loose statement. Leprosy and tubercle are both bacillary diseases, and both are contagious, though not markedly so; a man may live for years in close communication with patients suffering with one of these diseases, and yet escape contagion. As has already been pointed out, the contagiousness of trachoma is probably very variable, and when one takes into consideration the normal inhibitive power of healthy tissue one can, at any rate, hardly expect the attenuated virus of chronic and isolated cases to induce trachoma in a healthy conjunctival sac. The only true test of the con-

tagiousness of trachoma lies in the question of its transmissibility in its acute epidemic form; when there can be no reasonable doubt that active agents such as flies, or passive agents such as sponges, towels, etc., *do* directly carry and spread the disease through a district or community.

As a third argument, Mr. Ridley cites the great power of trachoma in resisting ordinary bacteria-destroying agents. Here, we are confronted by the question as to whether these bacteria-destroying agents do, in a large number of cases, ever reach the true source of disease, which probably lies in the subepithelial layers. If these layers are exposed to a strong solution of corrosive sublimate, then Mr. Kenneth Scott has shown that the disease can be cured by this powerful germicidal agent in a few weeks.

Lastly, the absence of giant cells in trachoma presents a difficulty to Mr. Ridley. He says that "these giant cells seem to him to be the tissue's special means of attacking slowly growing organisms, such as tubercle, while the leucocytes and the epithelioid cells suffice for the chemical products only."

Surely, this is rather a startling assumption to use as an argument against the bacterial origin of trachoma. There are, no doubt, writers who support Mr. Ridley in his views as to the uses of the giant cells in tubercle; but, as regards the object of the leucocytes, a very large and influential school, headed by Metschnikoff and others, believe that the leucocytes are themselves the main agents in attacking and consuming hostile micro-organisms. So that with equal authority, one might quote the exudation of leucocytes in trachoma as a proof of the bacterial origin of the disease. However, it would appear that neither the absence of giant cells nor the presence of leucocytes, the exact uses of which are, after all, somewhat hypothetical, can have much weight in the question of a bacterial or non-bacterial origin of this disease.

II. Has Any Micro-Organism been Isolated Which Can Claim to be the Etiological Factor of the Disease?

Unquestionably no organ has been isolated which fulfills the necessary condition appertaining to a specific organ-

ism. The bacterium most favored by the majority of writers is that advanced by Sattler and Michel; whilst many others, including Fuchs, believe the virus to be an attenuated form of gonococcus. Some writers, in relating positive results in their experimental inoculations of animals, may have mistaken a severe follicular conjunctivitis with muco-purulent discharge with true trachoma. This variety of conjunctivitis may be induced by many micro-organisms, and I have myself succeeded in doing so with a certain bacillus discovered in one case. Before any micro-organism can have any special claim to be regarded as specific, an histological examination must be made of the follicles, the formation of genuine granulation tissue established, and the organism found reproduced. These conditions have not yet been fulfilled by any investigator.

III. Is it Possible that Trachoma is Induced by a Variety of Micro-Organisms Rather than by One Special Microbe?

The possibility of such a solution of the question is the natural thought that follows the review of the bacteriological history of trachoma. Such a theory implies an origin by *mixed infection*, a condition of which there are some well-known instances scattered through the science of bacteriology. For example, the alliance of a streptococcus with the Klebs-Loeffler bacillus is responsible for certain special clinical symptoms that may complicate diphtheria; we further believe that the union of a streptococcus with the unknown specific organism of scarlet fever is the specific cause of scarlatinal nephritis. The clinical symptoms of pure streptococcic infection are either those of a general acute septicemia or of a local erysipelas; but when the organism becomes associated with the Klebs-Loeffler bacillus or the supposititious scarlatinal organism, the result is not an acute septicemia or a local erysipelas, added on to the ordinary clinical manifestations of diphtheria or scarlatina, but the production of new and special symptoms due to the alliance of two distinct pathogenic organisms.

If we apply this theory to trachoma, we know two main clinical features of the disease. Firstly, we have a muco-purulent discharge and a coincident inflammation of the

conjunctiva; and, secondly, we see the special manifestation of trachoma in the presence of bunches of granulation tissue, which are known as the trachoma follicles.

Now, all the known specific agents of a muco-purulent conjunctivitis have been found and isolated in trachoma, staphylococci and streptococci in several varieties—Weeks' bacillus, and other varieties of bacilli which are known to produce a muco-purulent conjunctivitis, but which have not been identified with any special form of inflammation. Any of these organisms, then, may produce a muco-purulent conjunctivitis, but not any single one, apparently, may produce trachoma. It is possible, perhaps even probable, that the accidental union in the conjunctival sac of two or more of these pathogenic organisms may be the specific cause of the special features of trachoma.

This theory of the mixed infection of trachoma must rest for the present upon a hypothetical basis; but, at least, it opens up a fresh field for investigating the origin of the disease, a field which, I venture to believe, will not be unproductive in its results.

It is worthy of note that during the last few weeks, L. Mueller, of Vienna, has published a paper alleging his discovery of a specific bacillus in trachoma (*Wiener klinische Wochenschrift*, 1897). Unfortunately, the publication is too recent for me to be able to obtain it in time for this paper.

A CASE OF "WORD" WITHOUT "LETTER" BLINDNESS.*

BY JAMES HINSCHELWOOD, M. D.,

GLASGOW, SCOTLAND.

In former papers of mine "word-blindness" was defined as "a condition in which with normal vision, and therefore seeing the letters and words distinctly, an individual is no longer able to interpret written or printed language." It was there pointed out that there are different forms which ought to be clearly distinguished from one another. In my first paper† a case of "letter-blindness" of singular purity was recorded, the patient having completely lost the power of recognizing all the written and printed characters with which he was previously familiar with the exception of Arabic numerals. In a second paper‡ a peculiar disorder was described, in which the patient's power of interpreting written and printed language was rapidly exhausted, and to which the name "dyslexia" has been given by Berlin. I have recently met with a third variety of "word-blindness," where the patient, still able to recognize the individual letters of the alphabet, is yet wholly unable to recognize or interpret the words composed of combinations of these letters. As an excellent example of this distinct variety of "word-blindness" the following case is, I think, worthy of careful record and consideration:

CASE 1.—A man, aged 53 years, on September 7, 1897, came home from his business about two o'clock in the afternoon, saying that he did not feel well and had to give up work in the morning, as he could not see to read or write. Shortly thereafter, whilst sitting on a chair, he became giddy, fell to the ground, and was unconscious, but only for a moment. He soon felt all right again, and in the af-

* A paper read at a meeting of the Glasgow Medico-Chirurgical Society on January 14, 1898. From the London *Lancet*, February 12. 1898.

† The *Lancet*, December 21, 1895.

‡ The *Lancet*, November 21, 1896.

ternoon went out for a walk. In the evening, about seven o'clock, without warning, he had a severe "epileptiform" fit, with general convulsive movements, and complete unconsciousness for about an hour thereafter. He remained in a dazed condition for about two days, but gradually recovered, and since then had been able to go about. On the advice of his medical adviser he had kept away from business. Ever since the fit he had been unable to read, and his medical attendant, Dr. Charles Whish, of Pollokshaws, brought him to me on October 11, 1897, to ascertain the precise nature of the visual defect which prevented him from reading. On examining him with the ophthalmoscope the only abnormal appearances to be found in his eyes were slight radiate lenticular opacities. These, however, were slight and situated at the periphery of the lens, so that they could not interfere to any great extent with the visual acuity. On testing him with the distance types, composed of separate letters, he could read the letters quite fluently, although his visual acuity was not quite up to the normal, being $\frac{5}{8}$. On testing him with the reading test types, composed of words and sentences, I found he could not read when made to rely upon vision alone. If allowed to spell out aloud each word letter by letter, he could read the words slowly and laboriously, just as a child spells them out when learning to read. When prevented from doing this he could not read words at all. The only exceptions were in the case of a few short familiar words, such as "the," "of," "to," etc. These he sometimes picked out with a certain amount of pride. On asking him not to attempt any longer to read the words, but to read the letters only, he read them off fluently line after line. His difficulties in reading words were precisely the same with the largest as with the smallest test types. On the other hand, he read the letters of the smallest test types, Jaeger No. 1, without difficulty with suitable glasses. He had precisely the same difficulty in reading written as in reading printed words. On testing him with figures, he could read them rapidly and fluently, not only the individual figures, but when combined into complicated groups of thousands, hundreds of thousands, and millions, and even in the form of very complex fractions. He could write to

dictation and copy correctly, although he could not read what he had written. The visual fields for white and colors were normal. I conversed with him on three different occasions for about an hour each time, and there was not the slightest evidence of verbal aphasia or amnesia, or of any speech difficulty whatever. His wife, however, informed me that since the fit he had occasionally forgotten the names of old friends and customers. He had also shown a disinclination to exert himself mentally, being disinclined to talk much even with his intimate friends. He was a man of the most regular habits, but before his fit he had considerable mental worry. His vessels were atheromatous. On the most careful examination no other symptoms were discoverable. The patient was seen by me on three different occasions. On the day preceding my last interview there was a history of a transient attack of tingling and paresis of the right arm during a meal, so that he had for a short time to use his left instead of his right hand. This rapidly passed off, and when seen on the following day, there was no trace of it. I gave it as my opinion that the inability to read was not due to any ocular defect, but to a lesion in the visual word-memory center, situated in the angular and supra-marginal gyri on the left side of the brain and supplied by a branch of the Sylvian artery; that the lesion was a small hemorrhage, or more probably thrombosis, occluding that branch of the Sylvian artery supplying the center. Whether the lesion would remain stationary, or extend, it was impossible to say. The patient was strongly urged to abstain entirely from business, so as to secure absolute cerebral rest, and iodide of potassium was recommended on the ground that there might be some specific affection of the cerebral vessels, although there was no history or traces of past specific disease.

For the after-history of the patient, which will be given very briefly, I am indebted to the kindness and courtesy of his medical attendant. About a week after consulting me slight paresis of the right arm and leg, and slight paraphasia began to manifest themselves. These symptoms rapidly developed, and within another week there was considerable aphasia and well-marked right-sided paralysis,

the face being now involved as well as the arm and leg. He complained greatly of pain on the left side of the head. When the aphasia was complete he was given block letters in order to see if he could not express his wants by means of these. He gave them to understand by signs that he recognized the letters, but could not combine them into words. The aphasia and right-sided paralysis became complete before his death, which occurred on December 8, 1897, about nine weeks after I saw him. There was no post-mortem examination.

The feature of the case to which I wish to draw special attention is the inability to read, which, when I saw the patient, was the only symptom present, but which enabled us to give a positive diagnosis that he was suffering from organic disease of a special area of the brain. The diagnosis of the true nature of the patient's inability to read was not difficult. In the ordinary routine he was first examined with the distance test types, composed of individual letters, and these he read without difficulty, showing that visual acuity for distance was nearly normal. When he was given the test types for near vision, composed of words and sentences, he was unable to read them. This inability to read was altogether independent of the size of the types, being the same with the largest as the smallest. For a moment this was somewhat puzzling. His ability to read the distance types, composed of individual letters, suggested the request that he should no longer attempt to read the words, but simply to name each letter successively. This he did with fluency, running through line after line of the test types, beginning with the very smallest, Jaeger No. 1. It was then clearly evident that the inability to read printed or written words was not due to any ocular defect, but was a cerebral disorder of vision. This defect forms a very interesting contrast to the first case reported by me, where the patient, having completely lost the power of recognizing printed and written characters, was in the position of a child who has not yet learned the letters of the alphabet. The present patient, recognizing the individual letters, but not being able to combine these into words, was in the position of a child who has learned the letters of the alphabet, but has made no further progress.

His inability was with words alone, and hence the case has been described as "word" without "letter" blindness. The patient was able to read, if he was allowed to spell out aloud each word letter by letter. The explanation of this is simple. He could recognize by sight only the individual letters, but by spelling them out aloud he appealed to his auditory word memory in the temporo-sphenoidal lobe, which enabled him to combine them into the corresponding word. An analogous condition was presented by my letter-blind patient, who, unable by sight to recognize a single letter, could frequently do so if allowed to trace it out with his finger on the table. He was thus able to recognize the letter by reviving the graphic-motor images of the letters, which are probably stored in a special center in the neighborhood of Broca's convolution.

In many of the recorded cases of word-blindness the precise nature of the defect is not stated, the reporter contenting himself with the statement that the patient was unable to read. In others the inability to read is complicated with word-deafness, motor-aphasia, or verbal amnesia, and from the proximity of all the cerebral centers concerned in the expression or interpretation of language it is easily understood how these complications occur so frequently. In such cases the problem is obscured by the simultaneous involvement of a number of cerebral centers, so that the precise significance of the ability to read is not clearly seen. This peculiar form of word-blindness, however, does occur altogether apart from any other defects. In the present case the patient, when seen by me, presented, on the most careful examination, no other symptoms of any interference with his powers of expression or interpretation of language. On looking over the recorded cases of this variety of word-blindness, I have met with two cases of singular purity, which will be briefly quoted as affording further typical and uncomplicated examples of word without letter-blindness. Swan Burnett, of Washington,* records the following case in a very graphic manner and with considerable detail:

CASE 2.—The patient was a clergyman, 82 years of age.

*Knapp's Archives of Ophthalmology, New York, 1890, Vol. XIX., p. 86.

Three weeks before he was seen by Burnett the patient had an attack of giddiness, followed by three general "epileptiform" seizures within two days. During the intervals of these attacks he remained in a condition of stupor, but at the end of the third day became fully conscious and felt quite well with the exception of weakness. He found, however, that he could no longer read, and therefore consulted Swan Burnett. On examination it was found that there was no ocular defect. It was also found that whilst he could read all the individual letters with ease, he was wholly unable by means of visual impressions alone to interpret written or printed words. Numerals were read correctly and with ease. Burnett observed that he read at once the amount of a check, but could not tell to whom it was drawn, or by whom. He could write either spontaneously, or to dictation, but was unable to read what he had written. His mental faculties generally, and memory in other respects, were unimpaired. There were no other difficulties in the expression or interpretation of language. All other retinal impressions were correctly interpreted. The patient died from an attack of pneumonia about a year after he was seen by Burnett. In the interval no essential change had taken place in his condition. His general mental faculties and bodily health remained good until his fatal attack of pneumonia. His reading faculty, however, was never regained. There was no post-mortem examination. Burnett remarks: "This case seems to be one of alexia, pure and simple. No other faculty, so far as the closest scrutiny and the most careful examination could determine, was affected except that of reading. This fact would seem to demonstrate quite conclusively the existence of a 'reading center,' separate and distinct from any and all other centers."

Mierzejewski* communicated in 1890, at the September meeting of the St. Petersburg Psychiatric Society, the following case of word-blindness:

CASE 3.—A physician, aged 56 years, of delicate constitution, infected with syphilis in his youth, suffered for a long time from chronic nephritis. In January edema ap-

*Neurologisches Centralblatt, Berlin, December, 1890, No. 24, p. 750.

peared and he had an uremic comatose attack which lasted four or five days. Two similar attacks, but of shorter duration, appeared thereafter. Some time after the third attack the patient observed that he had lost the power of reading, although he could easily recognize the letters. Mierzejewski, on examination, found that he could easily recognize every individual letter, but could not unite these into syllables or words. He wrote to dictation fluently and correctly, but could not read what he had written. He wrote prescriptions correctly, but could not read them again. He copied writing without mistakes, although he did not understand the meaning of the words he copied. He recognized and read figures, even when they were combined in a complicated fashion. His visual acuity was normal, and there were no abnormal appearances in the eye. There were no disturbances of speech whatever, and his general intelligence was unaffected. No sensory or motor disturbances, or any abnormality of the reflexes, could be discovered.

Mierzejewski claimed, after a perusal of the literature of word-blindness, that his case was unique, and that no case of word-blindness had been previously described in which the patient's power of recognizing individual letters was preserved intact. He proposed to call this new form of word-blindness "*cacitas syllabaris et verbalis sed non literalis*." This form had been described, however, fourteen years before Mierzejewski's paper. Schweigger* in 1876 recorded the following case:

CASE 4.—A man, aged 74 years, had a slight apoplectic attack, with loss of consciousness, and clonic spasms in the right arm, but no paralysis. Shortly thereafter the patient lost the power of reading. Schweigger found he could recognize the individual letters, but could not read the words composed of these letters. He read numbers with greater success, but here also he made occasional mistakes. There were no speech disturbances. Fundus appearances were normal. There was right homonymous hemianopsia. A few days after Schweigger's interview the patient succumbed to a fresh apoplectic attack. There

* Graefe's Archiv. für Ophthalmologie, Berlin, 1876, Vol. XXII., Abtheilung 3, p. 297.

† Loc. cit.

was no post-mortem examination. Schweigger remarks that he had previously seen a precisely similar defect in another patient.

These cases, then, afford typical examples of a special form of word-blindness, which may sometimes appear as an isolated cerebral symptom, uncomplicated by any other disorder in the expression or interpretation of language. On analyzing their salient features it will be found that all present a striking agreement: (1) They could read fluently the individual letters, printed and written, but could not interpret words composed of these letters; (2) they could read figures, both individually and when combined in the most complex manner; and (3) they could write spontaneously and to dictation, but could not interpret the words which they themselves had written, although they could read the individual letters. How are these symptoms to be explained? This question will be answered most clearly by discussing in succession each of these groups of symptoms. In my first paper on word-blindness† it was pointed out that clinical observation and pathology prove the existence of two higher visual centers in the cortex of the brain, having distinct, but closely allied functions. There is in the occipital lobe, especially in the neighborhood of the cuneus and calcarine fissure, the center for primary visual impressions, the perceptive center, the function of which is to bring into the sphere of consciousness a mental picture of the retinal impressions, and through which we become conscious of objects as occupying certain positions in the visual field. Lesions of this center are shown by defects in the visual fields. But there is in the angular convolution and its neighborhood another center, where these sensory impressions are received, retained and accumulated; the visual memory center. The intelligent recognition of any object can only be accomplished by a comparison of the retinal impressions in the perceptive center with the visual memories of past impressions stored in the visual memory center. Lesions of this center are therefore evidenced by mind-blindness in its various forms; that is, the individual, though seeing the object distinctly, is no longer able to recognize it, having no visual memory with which to compare it. In my other papers the

different varieties of mind-blindness were discussed, and it was shown that word-blindness is simply a special form of mind-blindness. In right-handed people the visual memories of letters, words and figures, seem to be stored in the left visual memory center only. The lesions of this left center are evidenced by disturbances affecting only these highly specialized visual memories or images, leaving, in most cases, quite unaffected the more general visual memories of form and color, objects and places. The inability to read in the cases under consideration can only be intelligently explained by a lesion affecting this visual memory center for words and letters. We are apt to forget that the power to read rapidly at sight has been acquired only by long and laborious effort. The complex cerebral processes involved in reading by prolonged practice are carried on with such ease and rapidity as to be removed from the sphere of consciousness and transferred to the mysterious region of unconscious cerebration. When disease disturbs the perfect adjustment of the elaborate cerebral mechanism we may sometimes get a glimpse of the complex processes which are constantly at work in the great laboratory of the brain.

Let us analyze a little more precisely the cerebral visual processes concerned in the act of reading. A clearer conception of the processes involved will only be attained if we consider the manner in which an individual learns to read. The first stage is to store up in the visual memory the individual letters of the alphabet and to learn to associate these with their particular speech equivalent. When this has been attained there is no difficulty in attaching to any letter its particular speech equivalent, as we have now stored in our memory center a visual image of each letter, which serves as a constant standard of comparison and recognition. This power is acquired with comparative rapidity, there being only twenty-six letters in our alphabet, or, taking capital and small letters, fifty-two visual images, in all, to be acquired. The next stage is to learn to interpret by sight words made up of different combinations of these letters, and to associate them with their corresponding speech equivalents. This can only be accomplished by gradually storing up in the visual memory cen-

ter the visual images of the different words. This is a more formidable task and requires for its accomplishment a prolonged period of time. At first the child reads by spelling out each word aloud, letter by letter, and thus, by appealing to his auditory memory, gets the proper word; or he may simply be seen to move his lips, spelling silently each letter, and thus appealing to his memory of speech movements, or glosso-kinesthetic memory, as it has been called by Bastian. He has not yet acquired the visual images of words, and therefore cannot yet interpret written or printed words by sight alone. But by prolonged and persistent practice he gradually comes to interpret printed and written words simply by looking at them; or, to put it in another way, he has now accumulated in the storehouse of his visual memory the visual images of words. When he now looks at a printed or written word he can instantly interpret it by comparison with the word-image in his visual memory, without having recourse to his auditory or glosso-kinesthetic memory. In short, he has now learned to read by sight.

Now, if by disease the visual word-center is completely destroyed, or if it is completely cut off from the primary perceptive centers in the occipital lobes, then the patient is both word and letter blind. But if the destruction is only partial, and that part of the center in which are stored the visual memories of letters remains intact, then the patient, though still able to recognize the individual letters by sight, will no longer be able to recognize and interpret words because he has lost the visual memories of words which he had acquired by years of laborious effort. He will be, so far as vision is concerned, in the same position as a child who has only mastered the letters of the alphabet, but has not yet attempted to read words. He will be able to read only by spelling out aloud each letter of the word, and thus appealing to his auditory memory. This was precisely the condition of the patients in the cases under consideration, and this view of the condition renders intelligible the phenomena observed. This idea of the grouping together of definite classes of visual images within the visual word-memory center may at the first glance seem somewhat fantastic, but certainly the study of clin-

ical facts points strongly to this conclusion. How else is the fact to be explained that all the patients referred to could read figures fluently, not only individually, but when combined in the most complicated fashion? In my first paper a strong body of evidence was brought forward to prove the complete functional independence of the visual memories of letters and figures, for it was clearly shown by clinical facts that the visual memory for letters may be entirely lost whilst that for figures is preserved intact. The case at present under consideration, with the others quoted, affords further proof. How can such complete functional independence be explained, unless on the ground of anatomical independence? The visual memories of figures must be preserved in a different area of the cerebral cortex from the visual memories of words and letters. Both classes of visual memories, however, are lost simultaneously with such frequency as to make it highly probable that they are deposited in adjacent areas of the cerebral cortex. Similarly, since clinical facts clearly show that the visual memories of words may be entirely lost whilst the visual memories of letters remain intact, we are driven to the conclusion that these are deposited in different areas of the cerebral cortex, but from the great frequency with which both are simultaneously lost it is evident that these areas are adjacent.

This view of the complexity of the visual word-center, and of the arrangement within its area of distinct groups of visual images, not only explains such cases as we have been considering, but renders intelligible those peculiar cases recorded from time to time, which, according to this view, would be regarded as cases of partial destruction of the center. As examples of the curious partial forms of word-blindness sometimes observed the following are interesting. Bruns and Stolting* have recorded a case in which the patient's inability to read printed letters and words was complete, but only incomplete for written characters and for figures. Berkham† had a case in which the patient was word-blind, but not completely letter-blind,

* *Neurologisches Centralblatt*, Berlin. September 15, 1889.

† *Archiv für Psychiatrie und Nervenkrankheiten*, Berlin, Vol. XXIII.

being able to recognize some letters. Weissenburgh* had a case in which the patient was word-blind, with the exception of a few words. Michel ‡ quotes a case where the patient could read the Gothic, but not the Latin characters. Charcot || had a case where the patient, knowing French, German, Spanish, Latin and Greek, lost the visual memory of a few of the Greek and German characters only. In Burnett's case, in Mierzejewski's, and in my own, the patients could write spontaneously to dictation and copy, although they could not read the words they had written. In their recent investigations Dejerne and Serieux § have shown that when the visual word-center is destroyed the patient can neither read nor write. He is agraphic because he can no longer call up in his mind the visual memories of letters which are necessary to stimulate the graphic motor center. In these three cases there was only partial destruction of the visual word-center, and the visual memory of letters was still preserved intact. Hence these patients could all write. I observed in my patient, however, that he wrote very slowly and spelt out each word as he wrote it. He could revive only the visual image of each letter, and not the visual image of the whole word. Hence his slowness in writing, and his necessity for spelling it out letter by letter.

With regard to the position of the visual word-center, this has been discussed in a previous paper.¶ It was there stated that, although its boundaries have not been finally laid down, still a constantly increasing pathological experience tends to prove that the center in which are stored the visual memories of letters and words includes the supra-marginal and angular convolutions, both of which belong to the inferior part of the parietal lobe. The visual word-center, like the speech-center, is unilateral, and in right-handed people is situated on the left side of the brain. This view is confirmed by a valuable collection of

* Archives de Neurologie, Paris, July, 1894.

‡ Berger: Les Maladies des Yeux dans leurs rapports avec la Pathologie générale, Paris, 1892.

|| Clinical Lectures in Diseases of the Nervous System, Vol. III., New Sydenham Society's Series.

§ Comptes-Rendus des Séances de la Société de Biologie, Paris, 1891-92.

¶ The Lancet, December 21, 1895.

cases at the end of a article by Starr on the pathology of sensory aphasia.* In twenty cases, where the patients were completely unable to read, the angular or supra-marginal gyri were found to be affected in fifteen, and in the others the lesions were in the neighborhood of this area, and therefore isolated the center.

There can be little doubt that this was the situation of the lesion causing the inability to read in the case which forms the subject of this paper. The history of the case is one of gradually extending thrombosis of the left Sylvian artery, with consequent softening of the brain, and this was the opinion of the consulting physician who saw the patient after the appearance of the right hemiplegia and aphasia. The branch of the Sylvian artery supplying the visual word-center is distinct from that supplying Broca's convolution and the motor areas for face, arm and leg. At the outset there probably was a partial blocking of the main trunk of the left Sylvian artery, and hence the preliminary symptoms. But the thrombosis had first blocked completely that branch of the artery supplying the angular gyrus and its neighborhood, and hence the purity of the symptoms when the case was seen by me. Shortly afterward the thrombosis extended to the branches of the vessel supplying Broca's convolution and the motor areas, and hence the aphasia and right hemiplegia. If part of this visual word-center received its blood from a different source, that part would escape destruction, and this is probably what has happened in the case under consideration. Nor is this supposition improbable, as the posterior cerebral artery supplies a large part of the cortical area of the occipital and temporo-sphenoidal lobes, which are in the immediate neighborhood of the word-center. It will be observed that in Burnett's case, in Mierzejewski's, and in my own case, the visual fields were normal. This is strongly in favor of the lesion being a cortical one. In subcortical lesions, where the word-center is simply cut off from the percipient centers in the occipital lobes, the word-blindness is nearly always accompanied by right homonymous hemianopsia. This is due to the fact that a subcortical lesion in the white matter of the left occipital

* Brain, Vol. XII., London, 1890.

lobe, so situated as to cut across the fibers passing from both occipital lobes to the left angular gyrus, must also involve the optic radiations passing to the left occipital cortex, and the patient will then be not only letter-blind, but also exhibit right homonymous hemianopsia. This is clearly exemplified and fully discussed in my first case,* where the patient was completely letter-blind and had right homonymous hemianopsia. The complete absence in the present case of any defect in the visual fields is thus in favor of the lesion being a cortical one, an affection of the center itself, as I have regarded it.

Although there was no post-mortem examination in the present case, I think the careful analysis of the visual symptoms is of considerable clinical value. When first seen by me the cerebral disorder of vision was the only cerebral symptom present, and it is from a study of these pure cases that we can hope to attain a more precise view of the nature of the different disorders embraced in the term "word-blindness." Pathology can teach us little apart from careful, thorough and correct clinical observation. In a large proportion of the hitherto recorded cases of word-blindness, with pathological examination, the nature of the visual defect is recorded so vaguely that the pathological examination loses much of its value. An increased and more widely diffused knowledge of the nature and varieties of the cerebral disorders of vision would lead to a more precise, rigorous and comprehensive examination of the symptoms during life, and consequently would give any subsequent pathological examination a greatly increased value.

* The Lancet, December 21, 1895.

ABSTRACTS FROM RECENT FRENCH OPHTHALMIC LITERATURE.

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The Proportion of curable Cases of Strabismus.

DE WECKER, Paris. (*Annales d'Oculistique*, January, 1898.) In an extremely interesting article by de Wecker, statistics are compiled from a private practice numbering 14,822 cases, and a clinical record of 52,800 cases. Of the paying patients about three per cent. were cases of strabismus, one per cent being of the divergent variety and two per cent of the convergent. Of the patients treated in the clinic about five per cent. were examples of squint in the proportion of one and sixty-nine one hundredths per cent. for the divergent type, and three and eighteen one hundredths per cent. for the convergent. Of the total number of cases, four and fifty-nine one hundredths per cent. were strabismic in character, as follows: Divergent one and fifty-nine one hundredths per cent., and convergent two and nine-tenths per cent.

Of the surgical measures to be employed in the treatment of strabismus, the author advises muscular advancement in those cases in which binocular vision is the end aimed at, and tenotomy either alone or combined with muscular advancement on the diseased eye in those cases where the object is simply cosmetic.

The restoration of binocular vision is the only thing considered a cure by him. All cases of monolateral strabismus in which the visual acuity of the deviating eye is less than one-fourth of normal, he considers as incurable. All cases of alternating strabismus he classes as curable, the combination of surgical with optical and ophthalmic meas-

ures producing the best results. These comprise five per cent. of the total number of cases of strabismus. Of the cases of periodic hypermetropia alternating strabismus, he believes that all are curable by the aid of correcting lenses. Periodic hypermetropic monolateral types with a visual acuity of less than one-fourth he has found are apparently curable up to the age of from twelve to sixteen years, but binocular vision can never be obtained. He also says that if vision is greater than one-fourth, they are curable. This type he has determined constitute eleven per cent of the total number. His experience is that periodic myopic strabismus frequently calls for surgical treatment with the use of correcting lenses, but he has found in such cases that if the vision of the deviating eye is above one-fourth and binocular vision for distance can be obtained with the accommodation relaxed, a cure may be expected.

These types constitute five and thirty-five one hundredths per cent. of the total number of cases of strabismus. Of the permanent monolateral varieties, those in which vision is greater than one-fourth and which are curable, equal fourteen per cent. of the entire number, while those in which vision is less than one-fourth and which are not amenable to treatment, form fifty per cent. of the total amount.

Spontaneous cure usually commences at the age of about ten years. It is most frequently found in periodic hypermetropic strabismus. It may also appear in the order given in the following conditions: Permanent alternating periodic myopic, and permanent monolateral strabismus. Such a cure occurs but rarely in cases of the divergent myopic variety.

He says that permanent myopic strabismus increases with age, the latent types becoming manifest.

Notes on a Case of Subconjunctival Lipodermoid of the Semi-lunar Fold.

VAN DUYSE, Gand. (*La Clinique Ophtalmologique*, January 25, 1898.) A new case of this condition is reported by Van Duyse, making four that are now on record. The peculiarity of this instance was the absence of hairs

and glands and the presence of unstriped muscular fibers. On this account he considers his case as being in all probability one partly of a papillary nature.

Concerning Pailoma of the Conjunctiva.

LAGRANGE, Bordeaux, and MAZET, Marseilles. (*Annales d'Oculistique*, February, 1898.) These authors report one case of this condition, and from their study of this and others seen by other observers have come to the following conclusions, viz: (1) Every true papilloma of the conjunctiva is composed of, (a) a mass of ascending vessels producing with more or less complications the type of diverse papillæ of the skin and mucous surface; (b) a new formation of the connective tissue of the seat of the neoplasm; (c) and an epithelial surface which is moulded to the same variety of tissue as the vasculo-connective vegetation. (2) A papilloma is benign unless the epithelium commences to proliferate, in which case it becomes malignant, and partakes of the characteristics of an epithelioma.

On the Concomitance of Total Ptoxis with Zona Ophthalmia.

FOUCHARD, Mans. (*La Clinique Ophtalmologique*, February 25, 1898.) Fouchard denies the rarity of the occurrence of zona ophthalmica, which most statistics show, his experience furnishing fifty-seven cases in a total of five thousand patients. In the instance reported, he calls attention to two peculiarities: (1) the presence of a grave ulcerous keratitis without a trace of eruption on the nose; and (2), the concomitance of a paralysis of a motor nerve with irritation of sensory nerves (a condition that is rarely observed.) He offers as a possible explanation of this second peculiarity, the anastomosis of the ophthalmic branch of Willis with the small thread which arising from the superior and inner side of the ophthalmic branch at the level of the nasal twig, is destined to the common oculo-motor.

A Case of Traumatic Enophthalmos Amellorated by Sectioning the Four Recti Muscles.

DARIER Paris. (*La Clinique Ophtalmologique*, Feb-

ruary 25, 1898.) In a case of this affection coming under Darier's care, he performed the above operation in one seance with marked benefit. During the operative procedure the eye was subjected to a digital examination extending a little back of the equator, and no adhesions could be discovered. Stereoscopic exercises were commenced the day after the operation, when it was found that all the movements of the eyeball were restored with the exception of those necessary to look down. Before the operation, abduction was the only normal movement, adduction being diminished and the power of the superior and inferior recti being nearly abolished.

Ocular Thermometry and Its Utility in the Diagnosis of Certain Diseases of the Eye.

GALEZOWSKI, Paris, (*Recueil d'Ophthalmologie*, January, 1898.) Galezowski describes an "ophthalmic-thermometer," the salient points of which are a bulb that is shaped to fit the form of the eyeball, and a tube that comes off at right angles to the bulb. He asserts that its use is attended with no inconvenience whatever. He considers that its more constant employment may serve to make clear much that is now obscure in regard to internal affections of the eye. He gives the normal temperature of the external surface of the eye as averaging from 35.7 C. to 36.2 C.

Some New Salts of Silver in Ocular Therapeutics. (Argentamine, Sulpho-Phenate of Silver, Argonine, Itrol, Actol and Protargol.

DARIER, Paris. (*La Clinique Ophthalmologique*, January 10, 1898.) Darier reviews the writings of several authors in regard to these new salts, and gives the results of his own experience concerning the ones he has employed himself. The first one discussed is argentamine, which is a solution of ethylene-diamine-phosphate of silver. Owing to the chemical action of its organic base, ethylene diamine, the precipitates formed by the action of the tissues on the salt are redissolved, thus giving it a penetrating power that is five times as great as that of silver nitrate. He has

found that the antiseptic action of argentamine is also stronger than that of the nitrate, this being particularly true when employed against the gonococcus. Another advantage is the fact that its application is attended with less pain than that following the use of the older salt. He employs it in the strengths of three, five and ten per cent. In purulent conjunctivitis he uses the strong solution twice daily. He also finds it useful in follicular and granular conjunctivitis. He says that it must be employed freely. He does not find that it is necessary to employ a previous application of cocain in every case. For most subjects the five per cent. solution strength used daily suffices for a cure.

Itrol employed as an insufflation in conjunction with sublimate lotions and ice compresses is strongly recommended by Mergl, of Strassburg, in purulent catarrhal and granular conjunctivitis. Some cases of corneal ulcer were cured by a single insufflation, while in others its use was followed by complete infiltration of the cornea. Actol has been recommended by Créde, but Darier has not had enough experience with it to speak authoriatively. He says that Mergl considers it more painful than itrol. Argonin and sulpho-phenate of silver are dismissed with but a few words for the present.

Of all these salts protargol is the one of which he speaks most enthusiastically. It is a combination of protein and silver and appears in the form of a fine yellow powder that is readily soluble in cold water. The aqueous solution is yellow and does not precipitate upon the addition of the alkalines, the sulphides or the albumins. The solution keeps perfectly. He prefers it in the strength of ten per cent. and has found best to combine it with an alkaline, such as normal salt solution, or a weak solution of bicarbonate of sodium. Of it he says, "Protargol, on account of its marked penetrating properties, its antiseptic action which is as strong as, and even stronger than that of nitrate of silver and argentamin, and above all, on account of its absolute harmlessness and the slight irritation which it produces when in contact with the conjunctiva and cornea, merits a methodical trial in all cases in ophthalmology in which nitrate of silver has been hitherto employed.

Delay in Cicatrization After Cataract Operations.

✓ VALOIS, G., Moulins. (*Recueil d'Ophthalmologie*, January, 1898.) Valois reports a case of this complication, the cause of which occurred during an operation upon an alcoholic of seventy-four years of age. Owing to a movement of the patient during the procedure the last portion of the incision was made through the cornea at about one and one-half millimeters distance from the sclero-corneal border. The rest of the wound healed kindly but this part remained almost wholly inactive. At the termination of seven days, what was supposed to be a small fragment of capsule, was removed from between the lips of the wound, but this did not produce any beneficial effect. Two days later reaction was stimulated by the application of thermo-cauterization points to the wound, this being followed in three days' time by complete cicatrization. The after results were good. He ascribes the trouble to an overriding of the edges caused by movements of the patient, to the position of the wound, and to the man's general weakened condition. In such cases he recommends the continuous employment of a compress bandage for several days' time as the first thing to be tried. If necessary, this is to be followed by stimulating the edge of the wound with caustics or the actual cautery. As a last resort, he considers the performance of an iridectomy, if this has not already been done, as a useful procedure.

New Operation for Lagophthalmos.

✓ KOENIGSHOEFER, Stuttgart. (*La Ulinique Ophthalmologique*, January, 1898.) Koenigshoefer suggests the following operation for cases of lagophthalmos following facial paralysis. An incision is made in each lid parallel to the edge and commencing one millimeter to the outside of the lacrymal point. These two incisions are so arranged as to run toward the inner canthus in which situation they meet. They include the entire thickness of the skin, care being taken to avoid wounding the canaliculi. The conjunctival flaps thus formed are sewed together, the sutures being tied on the ocular side of the newly made surface. The skin flaps are treated in a similar manner.

This procedure draws the lower lid up and turns the lacrymal points in in such a way that they are placed in good position to perform their functions.

In marked cases the outer angle still droops, this defect being corrected by the following procedure: An incision commencing at the outer canthus and running up toward and slightly beyond the outer end of the eyebrow, is first made. A second one starting at the upper end of the first and running toward and backward and ending on a level with the lower end of the first incision, is next obtained; an inverted V is thus formed. Another inverted V starting and ending within the first, but running higher upon the temple is then outlined. The first formed V now lies inside of the other, with their two extremities touching. The next step is to denude the surface lying between them, after which the apices of their angles and their edges are brought opposite to one another and are fastened with sutures. This procedure raises the outer canthus, thus permitting the lacrymal excretions to flow toward the canaliculi.

Actinomycosis of the Canaliculi.

LANGE, Brunswick. (*La Clinique Ophthalmologique*, January 10, 1898.) This case reported by Lange he says, makes seven on record. They have all occurred in women. He considers it probable that all the cases of parasitical concretions of the lacrymal caniculi which have been reported as due to other micro-organisms were in reality dependent upon actinomycosis. Owing to the constant action of the tears, the morbid agents are rendered practically innocuous, producing but slightly more trouble than any other foreign body.

Xerosis of the Eye and Its Treatment.

NESNAMOFF, Klearkan. (*La Clinique Ophthalmologique*, February 10, 1898.) Nesnamoff after reviewing the etiology and pathology of xerosis, suggests a line of treatment which meets with what he considers the two essential indications, namely, the cleansing of the surface of the cornea in order that the tears when excited may reach that.

portion of the organ, and the excitation of the flow of the tears themselves. The first indication is accomplished by a generous application of salt solution mixed with soda, the removal of the dead mucus scales, and lavage of the cornea and conjunctiva with a solution of sulphuric ether (this last producing an irritation of the terminal fibers of the fifth nerve and thus serving to fulfil to a slight extent the second requirement as well.) He states that the treatment may be completed by having the patient inhale ammonia, essence of mustard or oil of onions, five to six times daily at first—this to be reduced later to two or three times daily. This procedure, he asserts, acts by stimulating the nasal branches of the fifth nerve. He cites one case of the parenchymatous form of the disease treated in this manner with excellent results, as long as the patient was under observation. After the secretion had been established an artificial pupil was made, giving to the operated eye a visual acuity equal to the ability to see to count fingers at five or six feet distance. Before treatment the patient's vision was reduced to light perception only.

Some Considerations on the Motor Nuclei of the Nerves of the Eye; Apropos of a Case of Ptosis with Associated Action of the Upper Eyelids and the Lower Jaw.

COPPEZ, Brussels. (*Revue generale d'Ophthalmologie*, February 28, 1898.) Coppez commences his article with an enumeration of many cases similar to his own, following this with a minute description of the relational anatomy of the centers involved. His own case was that of a girl of eleven and a half years of age who was afflicted with congenital ptosis of the right eye. Her mother had had a difficult labor, and four years before the patient was first seen she had suffered from facial tic. Two other children were living and healthy. The father had tuberculosis, which had declared itself before the conception of the patient. In other respects than the ptosis the child was healthy, though she appeared of a rather nervous disposition. Coppez operated upon the lid, following the method of Gillet de Grandmont with success. Careful scrutiny, however, developed the following peculiarities: Winking was not simultaneous; at times one lid was low-

ered as the other was raised; sometimes one lid followed all the movements of the other, though only somewhat slower; and at times one lid remained immobile while the other preserved a normal aspect. When the patient looked up, both lids were raised simultaneously, but after a time the right one would droop. If the action was repeated several times the right lid would finally refuse to follow the left. Moreover, if the eyes were rotated from above to the right and from below to the left, there was a lack of co-ordination. In looking down, the right upper lid drooped more than its fellow, but was properly elevated when vision was directed from below to the left. The most remarkable feature of the trouble, however, was the fact that the upper right lid followed the movements of the lower jaw.

As the result of these findings, he says, the lid in this case is in connection with the anterior belly of the digastric and the external pterygoid muscles of the right side. It raises when the jaw drops, when the jaw moves from right to left, and when the jaw is projected.

The author reports the case on account of the following reasons: (1) The association between the movements of the parietic lid and certain movements of the eyeball (looking down and looking to the left); (2) The association between the parietic lid and certain movements of the inferior maxilla (movement downward); movement to the side; and movement in projection; and (3) Lack of association between the movements of the two upper lids.

He believes that the mesocephalic nucleus of the right levator palpebræ muscles does not occupy its normal position; it lies near the accessory root of the motor tri-facial instead of forming part of the gray column which gives origin to the third pair. Two facts he asserts confirm this: (1) The association between the movements of the two upper lids (proof that the two nuclei are not symmetrical and that the normal commissural fibers are absent); and (2) the participation of the levator muscle with the contractions of the anterior belly of the digastric and the external pterygoid muscles of the same size.

Parenchymatous Keratitis a Sequel of Influenza.

HILBERT, Lensburg. (*La Clinique Ophthalmologique*,

March 10, 1898.) Hilbert's case in a young man of eighteen years of age commenced seven days after recovery from the exciting disease. With the exception of a slight amount of bronchial catarrh, the patient's general health when first seen by Hilbert seemed perfect. There was no trace of syphilis or other dyscrasia.

There were all the symptoms of acute interstitial keratitis. All the layers of the cornea were infiltrated, this being more pronounced in the center of the membrane. The treatment instituted was: Rest in darkness, atropin, hot compresses, with pilocarpin twice a week were employed. In a week's time vessels commenced to penetrate the corneal tissue from above, and improvement became manifest. At the end of six weeks' time recovery was absolute and complete, vision having risen to seven-sixths. The most striking facts concerning the case were that both eyes were attacked with the same intensity, and the brief duration of the disease.

**Typical Ophthalmomalacia Complicated Later with
Glaucoma.**

TERSON, Paris. (*La Clinique Ophthalmologique*, March 10, 1898.) The patient, an unmarried woman of twenty-five years of age, when first seen was suffering from an intense double atrophic chorio-retinitis with double posterior polar cataract. She had all the symptoms of hereditary syphilis. Vision of the left eye equalled one-sixth of normal. With the right eye she was able to see to count fingers at three meters' distance. After two months duration of treatment, alternating between iodide of potassium and hypodermic injections of bin-iodide of mercury, which resulted in some benefit to the left eye, but none to the right, the patient demanded an operation on the latter eye. An iridectomy was performed. The coloboma was narrow and peripheral. The bandage was changed in seventy-two hours' time and everything was found to be in good condition. On the fifth day the dressing was removed and all was still well. On the evening of the eighth day the patient was seized with violent lancinating pains in the eye that had been operated upon, the pain lasting all night. The next day she reported at the hospital for treat-

ment, when it was found that the conditions were entirely changed. The sclerotic was reddened, the anterior chamber had disappeared and the iris was completely adherent to the cornea. Intra-ocular tension was markedly decreased. The scar of the wound was in good condition and there had been no escape of aqueous humor from that situation. Vision was greatly reduced. Hot compresses of chamomile were applied. By evening the pain had diminished. Atropin was also employed. By the end of the third day the condition was much better. There was no pain, the anterior chamber had restored itself, and tension had become normal. This state of affairs lasted two years, vision during that time being equal to one-tenth of normal. At the end of this time tension again began to rise, and when the patient was seen again at the clinic the lower part of the cornea was infiltrated as in glaucoma. This was of such intensity as to necessitate surgical intervention. The cause for these two, totally opposite pathological conditions has never been determined, though it was suggested that it was due to the most disturbed arterial tension, which was somewhat higher during the glaucomatous attack than during the preceding period of quiescence. The author recommends the study of such cases with the sphygmomanometer.

Intraocular Infection from Adherent Leucoma. Etiology and Necessary Treatment.

TERSON, (Senior), Toulouse, France. (*Annales d'Oculistique*; February, 1898.) Terson sums up his paper by the following conclusions:

The infection of old leucomata is of external origin, the danger being greater as the resistance is less.

To avert the disastrous effects, cauterization of the scar is necessary.

If hypopyon has not occurred, all that is necessary is to cauterize the external surfaces of the leucoma.

If hypopyon has occurred, we should with all prudence carry the cauterization to puncture with the formation of a transitory fistula.

Any patient afflicted with an adherent leucoma should be warned of the dangers of infection and be advised to

seek treatment immediately upon the appearance of any untoward symptoms.

Subconjunctival injections of bichloride of mercury are an aid and exceptionally may effect a cure alone, but should always be considered secondary to the method of cauterization.

The conjunctival graft is a valuable method of prophylaxis.

Subconjunctival Lipomata.

ROGMAN, Gand. (*Annales d'Oculistique*, February, 1898.) Rogman reports several cases from his own practice in which serial microscopic sections were made of the tumors. He comes to the conclusion that these growths may be lipomata pure and simple, without a trace of cystic formation, and that they are not certainly proven to be always of congenital origin.

A Case of Conjugate Paralysis of the Muscles of the two Eyes with Conservation of Convergence (restitutio ad integrum.)

LEDERER, Tiplitz. (*La Clinique Ophtalmologique*, February 10, 1898.) The case reported was that of a girl nineteen years of age who appeared well in every other particular, with the exception of her patellar-tendon reflexes which were exaggerated. The attack commenced with indefinite ocular pains associated with vertigo and cephalalgia during menstruation ten days before being seen. When first examined she complained of diplopia and of seeing objects in false positions. There was almost complete loss of motion of the eyeballs, the head being turned when she looked from side to side. The power of convergence appeared to be normal. A convex spherical lens of one diopter's strength gave normal vision to each eye. She was placed on a treatment consisting of one gram of iodide of potassium daily with galvanism, the electrodes being placed on the closed eyelids over the muscles which acting together produce lateral movements, followed by muscle exercises. The improvement was steady. One of the features noted during the course of treatment was that

the homonymous double images manifested by the red glass separated more widely when the eyes were turned down, and that they came closer together when the patient looked from the side or up. The author suggests that the nuclei of the abducens were possibly the location of the central lesion. He considers that the fibers which control lateral movements of the internal recti arise close enough to these former nerves for a common lesion to influence them both. He also suggests that the lesion probably consisted in some circulatory disturbance, rather than in any real change in the nerve tissue itself. He attributes very little to the treatment that was employed.

Opening of the Iridian Angle.

VALUDE and DUCLOS, Paris. (*Annales d'Oculistique*, February, 1898.) The article consists chiefly in a review of the work of de Vincentiis, Taylar, Sgrossa and de Wecker on the subject, with a report of six new cases operated upon by the authors. They recommend the needle knife of de Vincentiis, or Valude's modification of it, as being the safest instrument to be used, except in experienced hands. They state that the operations are all more or less modified from de Wecker's "sclerotomy." They recommend it for all forms of glaucoma, except the acute type, and even in these cases they feel that it may frequently precede iridectomy with advantage. They state that care must be taken to avoid making a counter-puncture, wounding the iris, or allowing the escape of the aqueous humor before completion of the operation. They have found that the results of the procedure, judging from over eighty cases on record, are of the happiest even in the chronic forms.

The Primary Modification of the Nerves in Simple Wounds of the Cornea.

RANVIER, Paris. (*Recueil d'Ophthalmologie*, February, 1898.) Ranvier states, as a starting point, that all nerves are subject to a continued growth, and that the terminal fibers, simple or branched, produce buds which in developing tend to augment the extension and complications of the nerve terminations themselves. He mentions the

three anatomical divisions of the corneal branches of the fifth pair of nerves, namely: the fundamental plexus, the sub-epithelial plexus, and the intra-epithelial fibers.

He states that immediately after an incision, including at least one-third of the thickness of the cornea, sensibility is destroyed in the segment bounded by the incision, and the two radii extending from the center of the cornea to the ends of the incision. He has found that the tissue to the marginal side of the wound retains its sensibility in entirety. To study the processes of healing he made sections, including both sides of the wound. These sections were treated with gold.

As a result of his experiments it was found that at the end of twenty-four hours' time the incision was completely covered with epithelium. In the marginal portion of the flap the nerves were still present, whereas in the central part they had disappeared, being absorbed by the other cells. Those in the marginal flap showed every sign of activity. The intraepithelial fibers were elongated, thickened, and presented swollen buds at their extremities. At the end of forty-eight hours' time these endings had pushed through into the cicatricial tissue. The nerves which appeared in this new tissue he attributes to two sources: A sliding over of the previous nerves with the epithelium, and a growth of the above-mentioned buds. By the third day these conditions were still more advanced, and the terminal buds had in many places reached the surface, both in the marginal and in the central flap. He considers that the phenomena of "chromatolyse" in sectioned nerves is due to a form of exhaustion produced by this rapid growth, just as it is produced by fatiguing the nerves with electricity.

Spontaneous Coloboma of the Iris.

DUJARDIN, Lille. (*La Clinique Ophthalmologique*, February 10, 1898.) Dujardin's case occurred in a patient suffering from irido-cyclitis, complicated with posterior synechia and cataract. The treatment which was being used for the disease was atropin locally, and iodide of potassium internally. Four months after this plan of treatment had been instituted the coloboma suddenly appeared.

It was in the upper segment, and was so perfect that at first the author supposed that the patient had consulted another physician and had been operated upon. This, however, the patient denied, and careful study failed to show any evidence of a scar. Eserin was instilled, but without result. No trace of the missing portion was ever found.

The Surgical Treatment of Granular Conjunctivitis.

DARIER, Paris. (*La Clinique Ophthalmologique*, February 10, 1898.) Agreeing with Kuhnt, Darier concludes that doubtful cases (those on the border line between follicular and granular conjunctivitis,) should be treated for the latter affection, although from a statistical and prognostic point of view they may be distinct. He divides the granular type into the acute inflammatory form, and the chronic atonic variety with the subacute exacerbations; the two forms readily passing from one to the other. For the purpose of illustration he separates the chronic into three grades, according to the intensity and the extent of the tissue involved. The mildest he treats by scarifying and cleaning the separate granulations, following this by lavage with a one to two thousand strength of cyanide of mercury, supplemented by an application of five per cent. strength of argentamine. He says that the argentamine is to be applied regularly for several days after the operation. The second grade he treats by a complete scarification of the trachomatous tissue, the free use of the curette or the Knapp forceps, and the cleansing of the surface with a short bristled brush dipped in a one to five hundred strength solution of cyanide of mercury. After the swelling has been reduced by the use of cold compresses, the diseased area is to be touched lightly with a ten per cent. solution of argentamine. The third grade requires even more energetic treatment. If there is any dacryocystitis, the lacrymal sac is to be thoroughly cleansed with a one to four hundred strength of cyanide of mercury, as the first step. In this grade he includes those cases in which the bulbar conjunctiva is involved, and this he attacks energetically, scarifying and curetting after a preliminary canthotomy. This is followed by carefully brushing the

tissues with a brush that has been dipped in a solution of one to five hundred strength of cyanide of mercury. The palpebral conjunctiva is treated as in the preceding grade, care being taken to gently handle it on account of its extreme friability.

The acute form he treats in a different manner, believing that the first indications to be met is the secretion, which should be checked as soon as possible, and the congestion. For the former he employs nitrate of silver, argentamine, or sugar of the suprarenal capsules; and for the latter he applies leeches to the temple. After the inflammation has partly subsided he resorts to the use of the sulphate of copper stick. Following this he has found that some cases require operation, this being most frequently dependent upon neglect upon the part of the patient. In very rare instances he operates during the acute stage, confining his procedures to mere light scarifications.

Contagion and Therapeutics of Trachoma.

MATKORIE, Croatia. (*Recueil d'Ophthalmologie*, February, 1898.) Matkorie's article is the outcome of an experience of nine thousand one hundred and sixty-six cases treated for the government of Croatia and Clavonia.

Being unable to find the specific microbe, he turned his attention to the chemical composition of the tears, thus reaching a very interesting conclusion that the numerous bacteria which flourish in the conjunctival sac when the tears are of normal alkalinity, are killed when this reaction falls below normal, and that the detritus thus formed generates toxins and ptomaines, which are the cause of the condition. The tears, he says, contain the highest percentage of alkaloids of any of the animal fluids, and this was found to be lowered in those patients who were suffering from trachoma. Exterior causes, such as climate, altitude, were also taken into consideration. As regards racial characteristics, he regards the gypsies as peculiarly exempt. In speaking of treatment, he recommends puncture and scarifications where the tarsus is affected, and believes in treating each case upon its individual merits. He urges the necessity of hygiene as a prophylactic.

ABSTRACTS FROM CURRENT GERMAN AND ENGLISH NEUROLOGIC LITERATURE.

BY WENDELL REBER, M.D.

PHILADELPHIA, PA.

For the Quarter Ending April 1, 1898.

BY PROF. HENSCHEN.

On the Geography of the Visual Path in General, and of the External Geniculate Body in Particular.

(*In Neurologisches Centralblatt*, March 1, 1898.)

Until recently our knowledge of the physiology of the cerebral ganglia, especially with reference to the value of such knowledge in the localization of abnormal intra-cranial processes, has been at best but general. Albeit the investigations of the last decade have revealed to us much concerning their intimate structure, and have also shed much light on the correlation of nerve fibers and ganglion cells.

Thus we know that certain ganglia situated directly within different cerebral paths convey stimuli only in a certain direction, notwithstanding that the conducting nerve fibers are interrupted within these ganglia; it is no less certain that other ganglia preside over reflex acts.

But, as to whether the peripheral nerves of special sensation have their impressions multiplied within the ganglion for distribution to a larger cerebral area in the sense of "projection of the original impression," our knowledge is meager indeed; nor is the prospect of a solution of these and other tangent questions very promising. Particularly perplexing and confusing are the views concerning the ganglia interpolated in the paths for the transmission of sensations of smell, taste and hearing, likewise the central ganglia found in the main encephalic sensory path.

Not so, however, in reference to the ganglia within the

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visual tracts. Not only are the anatomic relations of this path better known, but it is shorter, and the location and methods of expansion of its terminus are, to my mind, now defined with the greatest accuracy. Moreover, lesions within this tract may be diagnosed during the life of the patient with such wonderful precision as to inspire the hope that we may eventually penetrate the physiologic secrets of these interpolated ganglia. Only, however, by the most scrutinizing comparison of the record of the ante- with the post-mortem conditions can we hope to progress in this direction.

Before presenting my contribution to this progress it will be necessary to review briefly the present status of our knowledge of the paths traversed by the visual sensation.

The visual paths which arise in the retina and terminate in the calcarine area of the occipital cortex are composed essentially of two neurons, the first of which reaches from the ganglion cells of the retina to the corpus geniculatum, where the neuron ramifies; the second neuron, beginning at the ganglion cells of the geniculate body and terminating in fine arborizations in the cortex of the calcarine fissure. The geniculate body, therefore, breaks in upon the direct transmission of the impression. Within this body the visual-impression is transferred from the end elements of the retinal nerve fibers to the ganglion cells, which constitute the forward end of the occipital neuron. Necessarily, the manner in which the transfer is effected can only be speculative; v. Monakow's hypothesis is not only the best known, but it is also the one most generally accepted.

The geography of the fibers in the forward half of the visual path is now pretty well established, corresponding, as I have indicated in my work, ("Klinische und anatomische Beiträge zur Pathologie des Gehirns, I, II, ü III Theil,") with the disposition of the retinal elements. There is abundant evidence on this point. The position within the nerve of the papillo-macular fasciculus has long since been accurately mapped out anatomically, and in certain cases the position and course of the crossed and uncrossed fasciculi have been pretty well traced, as for instance in Marchand's, Norris', and my own case, in all of which the

clinical and anatomical findings agreed in their evidence that the dorsal or temporal quadrants of the retina are innervated by the dorsal fasciculus of the optic nerve, and the ventral or nasal quadrants by the ventral fasciculus. These findings have lately been substantiated by the interesting physiologic experiments of Prof. Pick, and we therefore consider the geography of the fasciculi, anterior to the geniculate body as fairly well settled.

When we come to consider the posterior half of the visual path, we have to deal with the parieto-occipital fibers or radiations, and their expansion on the cortex of the occipital lobe. The cortical visual substance is so disposed about the calcarine fissure that the dorsal lip of the fissure corresponds to the temporal quadrants of both retinæ, as shown by Hun's case, which agrees in all its features with one which I reported in my own work above alluded to (*loc. cit.*). Evidence as to the functional relations of the under lip of the fissure is meager, although Dr. Lanista, of Mexico, presented to the Medical Congress at Rome an instance of cerebellar abscess inducing quadrant hemianopsia (or better, tetranopsia), from which he argues for the existence of a visual center in the cerebellum. It seems, however, more plausible to assume that the abscess encroached in some way upon the visual center in the occipital lobe, in all probability the ventral aspect of that center, in which event, the case contributes weighty evidence to our knowledge of the grouping of the cells in the center for vision. Careful study of Sach's anatomical investigation of Foerster's case of bilateral hemianopsia seems to me to support my assumption as to the projection of the visual field upon the cortex of the occipital lobe.

In further support of this contention I shall present to the "Section on Neurologic Surgery" the report of a case in which a bullet was extracted from the dorsal aspect of the occipital lobe of a patient's brain. Subsequent estimation of the visual field showed a ventral quadrant hemianopsia (tetranopsia), indicating that the dorsal aspect of the occipital lobe is in intimate relation with the upper retinal quadrants.

The topography of the parieto-occipital tracts are but

feebly indicated by any findings, but there are three cases on record that furnish valuable data. The first, reported by Bruns, was an instance of inferior quadrant hemianopsia, or tetranopsia, following an injury (inflicted from above,) on one of the parietal lobes; the second (recently reported in the *Neurologisches Centralblatt*,) dealt with a similar but bilateral injury, following which there was found hemianopsia in the lower halves of both retinæ; the third (my own,) case is similar to the latter.

If all the foregoing evidence be now brought together, and the data properly arranged, the fact seems to stand out that the fasciculus which represents the temporal quadrants of the retinæ lies within the dorsal portion of both the anterior and posterior halves (or neurons) of the visual path. Further, that the fibers representing the medial or nasal quadrants of both retinæ lies within the medial portion of both halves (or neurons) of the visual path. This, therefore, indicates that there is a correspondence in the arrangement of the recipient elements of the retina with the arrangement of the recipient elements of the visual cortex. From all of which facts one might argue that an analogous disposition of elements obtains likewise in the geniculate body, but up to the present writing positive evidence on this point has been lacking. It is now my privilege to present clinical and anatomic evinence of such relation. I attribute no little importance to the evidence in this case, the more so, because it was studied clinically ante-mortem by Dr. Wilbrand, of Hamburg, whose researches in this field have brought him into special prominence. The post-mortem anatomic and microscopic examination of the brain were conducted later by myself. Briefly, the history is as follows:

X. X., female, aged 51. Up to her fifty-first year enjoyed excellent health. During that year sudden vertigo developed, followed soon after by apoplexy with hemiplegia and anesthesia of the left side. On September 6, 1889, Dr. Wilbrand found complete left lateral hemianopsia with concentric narrowing of the right half of the visual field. Five weeks later the upper half of the previously hemianopsic fields had become re-established, leaving hemianopsia of the inferior halves, or left inferior

tetranopsia. A year later these findings were substantiated, and two and a half years after this examination (or three and three-fourths years after the first perimetric estimations) the identical visual defect was again found. This was six weeks prior to her demise. Unfortunately her condition was such that no perimetric results could be obtained during the remaining six weeks. The necropsy revealed a hemorrhagic cyst situated in the occipital aspect of the thalamus and pulvinar, and destroying the integrity of the dorsal half of the geniculate body, but leaving the tractus and the occipital radiations intact.

Comparison of the antemortem clinical conditions with the postmortem findings in this case leads me to conclude:

1. That the dorsal portion of the geniculate body represents the dorsal or temporal quadrants of the retina. This finding or conclusion completes beautifully the gap in my previous scheme of the topography of the fasciculi of the optic nerve and their radiations. All the facts now harmonize perfectly in indicating the arrangement of the intra-cerebral visual path.

2. We are further justified in assuming that the above-mentioned affected area of the geniculate body innervates both halves of the retina, inasmuch as the quadrant hemianopsia was always lateral; this view I have for some time maintained and supported by anatomic investigations, (*Pathologie des Gehirns*, Part L.) Hence, the fibers related to the superior halves of both retinae mingle in the upper portion of the geniculate body, and it is probable that this arrangement obtains throughout the whole of that ganglion; however, it must not be forgotten that the fibers in the optic nerve of both eyes represent both halves of the retina until they reach the geniculate body.

3. The tetranopsia (quadrant hemianopsia) in the case cited was of long standing and clearly defined after the first indirect effects of the hemorrhage disappeared. The dorsal and ventral halves of the geniculate body cannot, therefore, act for each other, and we are thus furnished an accurate means for the localization of lesions. This conclusion is in complete accord with other clinical facts which I have frequently observed in my clinic. I recall three instances, all of which are almost complete reproductions of

the case cited above. In all three, lesion involving the dorsal aspect of the external geniculate body was assumed, and in all three tetranopsia was repeatedly demonstrated.

4. As is well known, the fibres that proceed backward from the retinal ganglion cells terminate in the geniculate body in a ramifying (bündelförmig) way. It is, therefore, held by some investigators that each retinal fibre is in relation with several of the ganglion cells of the geniculate body, and that in the event of arrest of function of some of the retinal fibres the remaining intact ones could act for them; and they further hold that in case of loss of function of the dorsal half of the geniculate ganglion, the ventral half likely assumes the duties of both halves. These are indeed the assumptions upon which v. Monakow's theory is builded. He holds, with Vialat, that such interchange does occur in the various portions of the visual center, a view against which I argued at the International Congress at Rome, and in opposition to which we can now offer clinical and anatomic data. Beautiful as is the theory of interchange of function on the part of the cells of the geniculate ganglion, it is not supported by ante or post-mortem findings. The degeneration found in the case I have reported above negates such construction of the facts. The ventral fasciculus of the occipital radiations was practically intact, while the dorsal fasciculus was completely degenerated. We are, therefore, led to believe in a "projection of the retina in the cortical visual center," a view to which I committed myself some time ago.

5. The latest investigations establish the fact that each retinal nerve fibre has contact points with several ganglion cells of the geniculate body. It, therefore, appears that the nerve impulse spreads equally in all directions and that a visual impression (not perception) may be transmitted by many different routes within the visual path, although the evidence in the case I have reported would seem to indicate that the contact between the end ramifications of the retinal nerve fibres and the ganglion cells of the geniculate body is rather limited. It will require much further investigation to reveal just what the physiologic significance of these facts may be.

SECTION ON OPHTHALMOLOGY; COLLEGE OF
PHYSICIANS OF PHILADELPHIA.

Meeting of March 15, 1898. George C. Harlan, chairman, in the chair.

G. C. Harlan's second case of *kerato-globus*, a sister of the case shown at the February meeting, presented many features similar to it; globular distension and perfect transparency of both corneas; deep anterior chambers; oscillating irides; lenses present; hyperopia of 5 D. and no cupping of discs. The horizontal diameter of each cornea is 14 mm. and of each ball at the equator 24 mm.; the pupils are only 1 mm. and under atropin $2\frac{1}{2}$ mm. During the past two months the vision has been failing and the fields are decidedly limited. The optic discs, examined with difficulty on account of the small pupils, appear dull and gray and the retinal veins engorged. The lowered vision is accounted for by the condition of the nerves and is independent of the *kerato-globus*. The parents and three children of the patient have no unusual ocular condition. The occurrence of this anomaly in two members of a family confirms the view of its congenital origin.

Discussion—Edward Jackson found the curvature of the corneas to be uniform almost to the scleral junction, and that the lenses were present but displaced slightly downward.

W. F. Norris believed that the R. lens was present, but in the left eye its presence was doubtful. The patient was probably suffering from progressive optic neuritis.

Edward Jackson showed a case of Anomaly of the Iris. The man, aged 69, had good sight until nine years before, when he had severe pain in the right eye and whole right side of the head. This eye now presents high irregular astigmatism and a pale optic disc. V. $\frac{2}{40}$.

The left eye had continued good until four years ago, when vision became impaired without pain or inflammation. There was a macula of the outer portion of the cornea; some opacity of the lens; and the iris at its upper

inner portion exhibited a small area entirely devoid of pigment, through which the fundus reflex was obtained. In this direction also there was an entire absence of the sphincter of the pupil. Other portions of the pupillary margin reacted to light, but this remained fixed. The pupil and iris of the right eye were normal. Patient denied all history of injury or inflammation in the left eye, and was positive this had remained good after the right eye had been impaired.

Charles L. Leonard, by invitation, exhibited and described his apparatus designed for the localization of foreign bodies within the cranium and orbit. (See paper in this issue of these ANNALS.)

Howard F. Hansell reported a case of diagnosis of the presence of a piece of steel in the left eye by the X-rays, and its location by the method of William M. Sweet. It was extracted from its site under the lower periphery of the lens after iridectomy, by the medium sized curved tip of the Hirschberg magnet. It weighed 9.5 mg. and measured $4 \times 2 \times \frac{9}{16}$ mm. The eye recovered perfectly from the injury, although vision is reduced to the perception of large objects on account of blood in the vitreous chamber. The X-ray plates, so valuable in the treatment of the injury, unexpectedly revealed the presence of another fragment of steel in the orbit near the external outer angle, of which no history whatever could be obtained. The only plausible explanation of its presence was that it entered contemporaneously with the other injury. Against this supposition, however, is the absence of any external wound, of hemorrhage, of bruise or contusion of the tissues, and that the second fragment was found after removal to consist of steel of a different character and quality from those of the other. Its localization was forcibly demonstrated by the response to the magnet, which, when passed over the skin in its immediate neighborhood, was invariably puckered and elevated. With the aid of the magnet it was easily excised, and its dimensions were found to be $6 \times 1 \times \frac{1}{4}$ mm., and its weight 23.5 mg.

William M. Sweet reported, by invitation, the results of his experience in the localization of foreign bodies in the eyeball by his apparatus. (See this issue of these ANNALS.)

Discussion—A. W. Goodspeed wrote: "In my opinion the simplest and most effective way to avoid X-ray burns is to employ an apparatus powerful enough to admit the tube being placed from 18 to 30 inches from the plate with an exposure far within the limits of danger, say not over ten minutes as a maximum. I prefer a slow-running brake also. My experience is certainly consistent with these views.

G. E. de Schweinitz detailed a case of a piece of steel imbedded in the sclera for two and a half years, localized by Roentgen's rays according to Sweet's method. In November, 1895, a piece of steel entered the eye probably near the corneal margin at the inner side. In March, 1896, a radiograph of the eye indicated that a foreign body was located in the orbit at the upper nasal side. It was deemed inexpedient to make search for it. In February, 1898, when Dr. de Schweinitz first saw the case, V. $\frac{6}{20}$; eye quiet; marks of a previous iritis; capsule and lens partly opaque; floating opacities in the vitreous. With undilated pupil no foreign body could be detected in the vitreous or in the coats of the eye. A series of skiagraphs taken by W. M. Sweet located it 11 mm. below the center of the cornea, 3 mm. to the nasal side, and 10 mm. back of the cornea. A second series taken while the eye was rotated as far as possible downward shows a movement of the body practically equal to the extent of the rotation of the eyeball downward. This would seem to determine the sclera as the site of the body. With wide pupil dilatation a small patch of choroidal atrophy streaked with pigment, and with a black center exactly in the position indicated by the radiographs could be seen. Just over this location the sclera was sensitive to the touch of the probe. The field of vision was markedly contracted and there was uncertain limitation opposite where the body was supposed to lie. The patient refused to permit an exploratory operation.

A. G. Thompson has had frequent opportunities of studying Dr. Sweet's method and had found it precise and practical. In reference to the burns from X-rays, he believed that the practical advantages gained by the X-rays far outweigh the deleterious effects produced by them.

After making this statement before the Association of R. R. Surgeons in Chicago, October, 1897, it was stated that six suits for malpractice were pending in the Chicago courts as a result of injuries sustained by the X-rays. In two cases an ear had sloughed away and in one an eye had been lost. Therefore, it was the custom to use the X-ray only on the patient's responsibility.

C. L. Leonard replied, in answer to several questions by William Thompson as to the details of his instrument, that it had been devised for the localization of foreign bodies anywhere in the head including the orbit, and although it had demonstrated in a number of cases the site of the foreign body in the eyeball, with great accuracy, none of these cases had as yet been operated upon, as the results of removal upon the improvement of vision had not sufficiently demonstrated the value of this procedure to induce the surgeons in charge to operate, and none of the cases had required enucleation.

The exposure employed was from five to ten minutes with the tube at a distance of eighteen to twenty inches. He preferred this distance, because the relation of any error, produced by unconscious movement of the eyeball, to these great factors in the calculation was almost without effect upon the final result, while in methods in which the calculations were based entirely on shorter measurements, with the fixed point on the eyeball, not only the foreign body, but also the fixed point would be moved, doubling the amount of error made, while the short distance of the measurements made the error produce a greater effect upon the final result. He followed numerous other observers in preferring to keep the patient's eyes closed during the observation, the visual axis being readily determined by observing the prominence of the cornea through the closed eyelid.

Wm. M. Sweet, while acknowledging the possibility of error from movements of the eyeball during the exposure, stated that he had found no difficulty in having the patient steadily fix an object during the short time now required in making the radiographs. With the eyelids closed as suggested by Dr. Leonard, there were no means of determining the visual axis, an important factor in accurate

work. It is not alone necessary to state the distance the body is from a fixed point at the side of the head. The surgeon to successfully remove the body must know the relation which this spot bears to the structures of the eyeball. A body located a certain distance from a fixed point of the apparatus might be inside the globe in adduction and outside in the orbit in abduction. There must exist a factor of uncertainty in any determination of the position of a foreign body in the eye that fails to take in account the axis of the globe with the photographic plate and the indicating objects, and also the varying position of the eyeball in different individuals with respect to the external orbital angle.

HOWARD F. HANSELL,
Clerk of Section.

CORRESPONDENCE.

GOUT AND GLAUCOMA.

(Correspondence in the *Medical Review*, St. Louis, March 26, 1898.)

Dr. S. O. Richey, Washington, D. C.

MY DEAR DOCTOR:—The *Medical Review* of February 5, 1898, contains a symposium on "Glaucoma," and the discussion of the papers, which I thought might interest you, I send you by this mail. I especially send it to you on account of the fact that *you* are entirely overlooked on the question of etiology and treatment.

You will see Dr. Henderson credits Dr. Reynolds, of Louisville, with having broached the theory that *gout and rheumatism* have something to do with glaucoma. What astonishes me is, that this entire body of intelligent gentlemen should be ignorant of the fact that you have championed the cause—gout as a factor in glaucoma—for ten years or more, and have read and published numerous able and detailed papers on various occasions. If I felt at all like being polemic, I would surely answer these St. Louis men.

I thought maybe you would like to refer them through the same journal, to some of your labors in this direction, and hence I send you the journal and this letter. With best wishes, your friend,

T. E. MURRELL.

Tucson, Arizona, February 10, 1898.

EDITOR MEDICAL REVIEW:—I enclose to you a letter written by Dr. T. E. Murrell accompanying a copy of the *Medical Review* of February 5, 1898, which will explain to you the reason of my communication. You may observe from the second letter that I have the doctor's permission to publish this letter showing in what way the symposium of papers on "Glaucoma" and the discussions upon them came to my notice.

Feeling sure, as Dr. Murrell does, that the gentlemen engaged in the discussion for some reason were not cognizant of my work on the subject, I beg you to give publicity through your journal to the following facts:

In 1889, in the discussion of a paper read by Dr. E. Gruening in the American Ophthalmological Society on "Iridectomy in Glaucoma," my remarks foreshadowed the view of glaucoma which I have since presented many times. The remarks appear in the Transactions of that year.

In 1892, I read a paper, "The Prime Etiological Factor of Glaucoma is Constitutional," in the American Ophthalmological Society, in which I endeavored to show that glaucoma depends upon gout as a cause. It appears in the Transactions of that year and also in the *American Journal of the Medical Sciences*, November, 1889.

The following papers have appeared since:

"The Disease-Process, Glaucoma." (*American Journal of the Medical Sciences*, June, 1893).

"The Halo Symptom in Glaucoma." (*Trans. Amer. Ophth. Soc.*, 1894, and *ANNALS OF OPHTHALMOLOGY*, July, 1894.)

"Chronic Interstitial Ophthalmitis (Chronic Simple Glaucoma)." (*ANNALS OF OPHTHALMOLOGY*, July, 1895).

"The Management of Glaucoma, Chronic Simple Glaucoma (Chronic Interstitial Ophthalmitis)." (*Trans. Amer. Ophth. Soc.*, 1896, and *ANNALS OF OPHTHALMOLOGY*, October, 1896).

"Gout and Rheumatism as Factors in the Etiology of Glaucoma," read in a general meeting of the Congress of the American Physicians and Surgeons, May, 1897, published in its Transactions, and in the *ANNALS OF OPHTHALMOLOGY*. July, 1897.

"Taxis in Increased Intraocular Tension," read in the American Ophthalmological Society, May, 1897, and published in its Transactions, and in the *Journal of the American Medical Association*, May 29, 1897.

All these papers were written to the same end; to show that acute glaucoma is a passive congestion of the bulb, due to venous obstruction caused by gouty changes in the circulatory apparatus of the globe; that chronic glaucoma, due to the same vessel changes, developed more gradually and without the sudden force of the acute form, takes the course of chronic connective tissue changes characteristic of venous obstruction and the consequent edema; that what will influence for the better the impediment to active circulation in the *venæ vorticosæ* and *vena centralis*, will favor the control of glaucoma, acute or chronic.

As the *ANNALS OF OPHTHALMOLOGY* is published in St. Louis, and has always had a wide circulation, it was natural to conclude that most of my work on this subject is familiar to my reading colleagues in St. Louis, and I do not understand why this is not so. It is late for any one to be credited with the discovery of the etiologic relation of gout to glaucoma, as that relation has been suggested from time to time since the days of Hippocrates. My undertaking has been to show *how* gout causes glaucoma; in other words, that glaucoma is gout of the globe of the eye, as podagra is gout of the toe. This view is supported by the pathological changes, by clinical observations, by therapeutic experiences, and by some late interesting experiments in which true glaucoma was for the first time experimentally produced by ligaturing the *venæ vorticosæ*.

While gout has for so long been suggested as a possible cause of glaucoma, this was merely a suspicion which never received consideration, because the connection had not been shown beyond the fact

of gout and glaucoma sometimes developing in the same individual. When, after twelve years devoted to the study of the subject, I reached my conclusion, the effort was begun to have my fellows see the "reason for the faith that was in me."

It is not my desire, nor do I intend, to engage in a polemical discussion, but only to offer to your readers the references by which they may find and know the work done on this subject, as I really did not appreciate that gout and glaucoma could be named together without mention of some of the papers above enumerated.

STEPHEN OLIN RICHEY.

Washington, D. C., March 10, 1898.

[It is only fair to Dr. Henderson to say that in a reply to Dr. Richey he disavows any intention to withhold due credit but that none of the speakers "had occasion to draw attention to the etiological views of Dr. Richey or anybody else.—C. A. W.]

NOTES AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest to its readers. Please address Albert B. Hale, M. D., 103 State street, Chicago.)

Prof. A. Anagnostakis died in Athens, aged 71.

Dr. M. Peschel of Turin has been appointed a. o. Professor of Ophthalmology.

v. Hippel in Heidelberg has been promoted from docent to Professor of Ophthalmology.

Dr. Dawson Williams succeeds the late Ernest Hart as editor of the *Britis Medical Journal*.

Dr. Topolanski has been appointed privatdocent of ophthalmology to the University of Vienna.

Privatdocent Dr. Greef has been appointed director of the eye department of the Berlin Charité.

Prof. Dr. Max Burchardt, director of the eye department of the Charité died September 26, 1897, in Berlin.

Sanitätsrath Dr. L. Alexander, well known as the author of "Syphilis and the Eye," died October 17, 1897, in Aachen.

Prof. Dr. Axenfeld has been appointed to the chair of ophthalmology in Rostock, made vacant by the death of Prof. Berlin.

Berlin is about to have a social club near Unter den Linden, qualification for membership in which shall be the active practice of medicine.

Dr. Frank C. Todd, of Minneapolis, has been appointed Clinical Professor of Ophthalmology and Otology in the University of Minn-

esota. This chair was made vacant by the resignation of Dr. Frank Allport, who is now practicing in Chicago.

Dr. A. M. Berger has found in the Victoria Library a collection of recipes and prescriptions for eye trouble, written by the great Michael Angelo. This proves, of course, that Michael Angelo was eye doctor, as well as painter, sculptor and architect.

I am so much indebted to Dr. Geo. M. Gould and to his indispensable Philadelphia *Medical Journal*, for much of my news and other delightful reading, that I take this opportunity to acknowledge my peculations, preferring to show my gratitude in the lump, rather than to itemize it.

Geheimer Hofrath Prof. Gerald (Halle) has devised a method of neutralizing the nicotin in cigars by saturating the tobacco with *organum vulgare* (wild majorian) combined with tannin. Tobacco so treated is quite harmless, but retains its original flavor and savor! The cigar is patented!!

The ninth congress of persons interested in the instruction of the blind will be held in Berlin in July next, and the United States has been invited to send representatives to the Congress. There will be an exhibition of methods of teaching and of work performed by the blind, in connection with the Royal Institution at Steglitz.

Sohon (*Virginia Medical Semi-Monthly*, January 28, 1898,) claims that cigarettes are no more injurious than tobacco in any other form, being made of tobacco and not rendered more deleterious by the admixture of tobacco. It is only a difference between a frequently repeated mild intoxication and a more profound form at longer intervals.

S. B. Twitchell (*Ohio Medical Journal*, January 1, 1898,) discusses the resolving power of the microscope. Up to the present, Nobert's twentieth band, 225,190 lines to the inch, or about 9 to 1 in. has never been resolved, and theoretically with white light, only 146,543 lines per inch can be distinguished. By utilizing, however, the shorter actinic rays and a photographic plate, theoretically 193,037 lines per inch should be resolved, that is effects beyond the possibility of ocular vision.

"The Removal of Cataract Without Surgical Interference," is the startling head of a circular recently issued, sent to me (and others. I

am sure); in it there are exploited the virtues of a new drug discovered, like the balm for lost manhood, by an unselfish doctor in the South Sea Islands. This boon to mankind (how about the eye surgeons?) is sold to the profession only (sic) at one dollar per bottle. For further particulars apply at this office.

Anton Czechow, the most widely read of modern Russian novelists, is a practising doctor. At a very early age he published humorous sketches and psychologic studies remarkable for maturity of thought and style. His "Windbags," "Waldoga the Great and Waldoga the Little," and "Ariadue" appeared in 1896 and 1897, following rapidly on "Russian Love," a volume of short studies, which, in a translation, enjoys an immense popularity in Germany, and has run through several editions. His latest novel, "The Peasants," caused a great sensation in St. Petersburg. In it the Russian peasantry are painted with a realism as ruthless as the French peasants are portrayed in Zola's "La Terre."

According to *Nature*, Professor George M. Stratton, of the University of California, recently made an experiment upon himself by wearing for eight days a mask fitted with lenses which invert the visual image, thus projecting it upon the retina in an erect instead of the normal inverted position. He soon learned to refer all objects to their correct positions—in other words, to see them right side up; but, on removing the apparatus at the expiration of eight days, everything appeared to be upside down at first. He, therefore, concludes that the seeing of objects right side up is due to a mental rectification of the visual image actually projected upon the retina.

A certain medico-legal case is still unsettled in a certain part of Germany. A young child (girl) was taken by the parents to a doctor for some eye trouble. He used a silver solution on the lids, but the child afterward went blind. The parents sued for malpractice, claiming damages (the judge insisted on specific damages as part of the suit) at 30,000 marks, or a yearly payment of 1,500 marks, because the child was now unable to earn a livelihood. The physician's lawyers objected, that this sum was exorbitant, other cases having been settled for 4,500 marks. They also claim that up to 14 years of age the child should be cared for by the parents, in any case. The judge called for the advice of the director of a blind asylum as to wage earning powers of the blind, and as to the cost of educating blind children.

Mikulicz's disease, chronic enlargement of the lacrimal and salivary glands, is evidently to have a place in medicine and surgery, at

least for the time being. When chronic swelling of any of these glands is noted, surgeons and medical men, especially the younger ones in Berlin, almost invariably suggest the possibility of the new disease, and proceed to the differential diagnosis. The absolute symmetry of the affection is not considered to be an invariable distinctive feature of the disease, and there would seem to be a growing impression that it is often a post-syphilitic affection, though it does not always yield to specific treatment. The name suggested for it recently by Mikulicz's assistant, in an article evidently inspired by Mikulicz himself and published in his journal (*Communications from the Borderland Between Medicine and Surgery*) does not seem to meet with much favor, and the discoverer's name is usually applied to it in describing it. Achroacytosis, literally the replacement of glandular tissue by colorless, *i. e.*, lymph-cells, is thoroughly descriptive of the pathological condition underlying the disease, but somehow seems to be looked upon as far fetched.

The California Ophthalmic and Aural Institute opened its hospital department on Thursday, February 17. The Institute is incorporated under the laws of California, along the same lines as the Ophthalmic Institute of Dr. Knapp, in New-York. It has the privilege of conducting a hospital and an out-door department, and also of giving instruction in the special lines of eye and ear diseases, and of issuing certificates or diplomas to those who have taken such courses. The first undertaking of the Institute was the instruction of a number of opticians in refraction. The hospital is the most recent development, and for the time being, until that is running well, instruction will not be taken up again. The institute is incorporated with the following directors: William H. Mills, Charles Webb Howard, Henry N. Clement, Edward B. Jennings, and Louis C. Deane, M. D. The first two named gentlemen are prominently connected with the Southern Pacific Railroad. The hospital staff consists of Drs. Louis C. Deane and Redmond Payne, oculists and aurists, and Dr. Phillip King Brown, pathologist. San Francisco is provided with a goodly number of oculists and aurists, but this is the first hospital organized exclusively for the accommodation of these special cases. It is the desire of the management of the Institute that the specialists in the city and vicinity will take advantage of the hospital for their private cases; any physician may attend his own patients in the hospital without interference.

The third annual meeting of the Western Ophthalmological, Otolological, Laryngological and Rhinological Association was held in Chicago at the rooms of the Chicago Medical Society, on April 7 and 8. The most important of the general business was the election of Dr. J. Elliott Colburn, of Chicago, as president, Dr. Wm. Scheppegegrell, of New Orleans, 1st vice president, Dr. Casey A. Wood, of Chicago, 2nd vice president, Dr. H. Gifford, of Omaha,

3d vice president, and Dr. F. M. Rumbold, of St. Louis, as secretary, the selection of New Orleans as the place of meeting on the second Thursday of April next, and the change of name, by evolution, from its past cumbersome form to "The Ophthalmic, Oto-Laryngologic Association." This last is much easier said in one breath, and avoids the danger of supposing that the poor nose was of too little importance to receive mention. From Oto to Laryngomust, of course, include everything lying between—not only the nasal gateway and eustachian highways, but also the pharyngeal by-paths and the tonsillar (sub-lingual and merged) obstructions, or what the golf enthusiast would call hazards. The forty-three registered members by no means accounted for the whole number of those present, for the rooms were at all times full, and often crowded, and fully 160, including Chicago guests, took part in the discussions. The sociable feature of the meeting was by no means the least important, the entertainment committee having generously provided the Thursday evening's reception given below. There were both dry and wet goods for the guests, all of whom seemed to know just what was en regle in such reunions.

1. Armour Mandolin Club—Mr. Geo. A. Colburn, leader.
2. Roberto—Prestidigitator.
3. Mr. A. E. Carlson—Miss De Costa, accompanist.
4. Mr. George Day—Impersonations.
5. Miss Ida Howell—Popular songs.
6. Pascatel—Contortionist.
7. Mr. W. Balster—Popular songs.
8. Mr. George Day.

The scientific section work was of more than usual interest, and to my mind the Ophthalmological division allowed the Oto-Laryngological members to outstrip them. The battle ground of the eye campaign seemed to center around the question of conjunctival asepsis and antisepsis; at first the charge of the antiseptic brigade, headed by General Cleanliness and his aid Boric Acid, overwhelmed the less aggressive opponents, but there was a rally at last, and those who trusted to nature's methods of asepsis and to General Good Health, forced the opponents to leave the question undecided. (The Cuban war fever is responsible for this phraseology, but I might better continue now.) All this, however, was but a skirmish compared to the conflict in the next room, over the mas-toid. Here the battle waged most pitilessly. The standards of microbes, gauze drains and hot water douches were again and again attacked, and even when adjournment had finally taken place, the mutterings of intra-cranial war could still be heard in the hallways and elevators.

Altogether, the meeting was most agreeable and profitable.

BOOK NOTICES.

ATLAS OF OPHTHALMOSCOPY.

OELLER, J., Münich. (*Atlas der Ophthalmoscopie*. Heft IV., J. F. Bergmann, Wiesbaden, 1898.)

This is the fourth number of Oeller's already famous atlas of ophthalmoscopy. The other three parts have been favorably reviewed in these ANNALS. The fourth part contains 15 plates in artistic value and scientific accuracy, quite equal to the preceding parts. There are two plates of the normal eyegrounds, others of neuro-retinitis, atrophy, foreign body in the nerve, diabetic retinitis, proliferating retinitis, pre-retinal hemorrhage, hemorrhage in the macula, chorio-retinitis, choroiditis, coloboma of the choroid, and two of coloboma of the nerve. These plates are all drawn from actual cases, and are accompanied by descriptive text, both in German and in English; the latter translated by Dr. A. H. Knapp, of New York. The plates are eminently suitable, not only for the atlas but for ornamental purposes for the walls of the laboratory or the lecture room. Although the whole set is somewhat expensive (100 marks) it should be in the hands of every ophthalmoscopist who can afford its purchase.

H. V. W.

SKETCH BOOK FOR DRAWING OPHTHALMOSCOPIC PICTURES.

HAAB, O., Zürich. (*Skizzenbuch zur Einzeichnung von Augenspiegel-Bildern*. Printed by J. F. Lehmann, München; second edition, 1898.)

This sketch book is useful for rapid delineation of the more common ophthalmoscopic pictures. If ophthalmoscopic appearances are drawn, especially in colors, observation is apt to be more complete. The author shortly describes methods of pictorial illustration with such ordinary instruments as the rule, mucilage and pencils of various colors, by which the average ophthalmist can make pictures himself. By the use of this sketch book of Haab's any oculist can make an atlas for himself from his own material which, while it will not take the place of Jaeger's, Liebreich's and Oeller's atlases, will certainly prove of advantage.

H. V. W.

DISEASES OF THE EYE IN THEIR RELATION TO OTHER AFFECTIONS.

SCHMIDT-RIMPLER, H., Göttingen. (*Die Erkrankungen des Auges im Zusammenhang mit anderen Krankheiten*. Price 13 marks, about \$3.25. Published by Alfred Holder, Vienna, 1898, 566 pp.)

This is the XXI Vol. of the work on special pathology and therapy edited by Prof. Dr. Herman Nothnagel, and a large number

of continental German authors of international fame. The whole number of volumes is 24, and it is the largest and most comprehensive work on medicine that has yet been undertaken. Some of them are larger than the volume which is here noticed. The general tendency of the work is to show the clinical side of the subjects therein considered.

In this volume upon the relation of eye diseases to general affections the author states that all progress in the healing art has been attended by frequent revolution and ophthalmology is no exception to the rule. While in the beginning of this century, as written by Beer in 1843, it was considered that all local eye affections were but parts of general affections and up to 1842, the eye diseases were denominated by their supposed origin. After the discovery of the ophthalmoscope this apparently etiologic description gave way to one of an anatomic nature, such as described by Desmarres in 1854.

There has been published recently a large amount of literature upon the relations of eye diseases to those of other organs and to general affections, but the author fears that many writers have been too extreme in this direction, especially as regards the relations of eye diseases to those of the nose, to gynecologic, skin, and to neurotic affections. He describes his subject under the following general titles:

Diseases of the nervous system including, (a) loss of vision and eye affections in which the ocular symptoms of various nervous diseases are delineated. (b) Special review of diseases of the nervous system with their ocular relations. Then follow diseases of the kidneys, constitutional diseases, diseases of the circulatory and respiratory organs, infectious diseases and poisons, diseases of the organs of reproduction, diseases of the digestive organs and skin diseases. The work is well fitted to take rank with that of Knies in the estimation of the specialist, but is more technical and is approached from the standpoint of the clinician. Literature is freely quoted, but there are few illustrations, a fault which seems incomprehensible in these days of pictorial description. The author's style is clear and the book is to be recommended to all advanced workers in ophthalmology and neurology.

H. V. W.

THE SIGNIFICANCE OF OCULAR CHANGES FOR THE DIAGNOSIS OF DISEASES OF THE BRAIN AND SPINAL CORD.

SCHWARZ, OTTO, Leipzig. (*Die Bedeutung der Augenstörungen für die Diagnose der Hirn- und Rückenmarkskrankheiten*. Berlin, 1898. S. Karger.) Price 2.50 mark (\$1.00).

This little work of 100 pages will give the ophthalmologist as well as the neurologist, a clear insight into the diagnostic significance of ocular changes in diseases of the central nerve system and prove of special value to the neurologist, as it is therein concisely shown how the neurologic diagnosis can be helped from the examination of the eyes. Other works upon the same subject do not deal with these eye changes from his standpoint, and the subject, although treated

in many text books upon neurology and general medicine, is distributed over many pages and not so clearly discussed. The localization of brain tumors and changes in the eye occurring in hysteria, are systematically described in a most interesting manner. Ten pages are taken up by general remarks upon the connection of the eye with different nerve disturbances, after which the subject is dealt with from a neurologist's standpoint, the changes in the different portions of the eye and the ocular symptoms being described under the nerve diseases. This little work is to be recommended to all physicians, as it shows the intimate connection between ophthalmology and general medicine.

TREATMENT OF DISEASES OF THE EYE CONNECTED WITH DISEASES OF NUTRITION, OF THE BLOOD AND OF THE LYMPH SYSTEM.

EVERSBUSCH, O. (Behandlung der bei den Krankheiten des Stoffwechsels des Blutes und des Lymphsystems vorkommenden Erkrankungen des Sehorgans. Penzoldt u. Stintzing's Handbuch des spec. Therapie innerer Krankheiten. Bd. II., Abtheil. 3.)

In his short preface the author gives a resumé of the causes of eye diseases accompanying constitutional anomalies, and lays stress upon accurate diagnosis of these diseases for prognosis of the eye affections. The degree of general nutrition affects each portion of the eye, eyelids, lacrimal apparatus, conjunctiva, sclera, etc. Knowledge of these conditions is quite as necessary for the oculist as well as the general practitioner, as some local affections should be recognized to be due to constitutional diseases and treated generally as well as locally. From the large mass of material given by E., only a few points will be here mentioned. He described diseases of the eye and adnexia in eleven subdivisions. In phlyctenular conjunctivitis and keratitis, in stubborn eczema of the eyelids and inflammation, E. gives weight to the fact that there is a connection between these and a general lymphatic constitution, and has found the same in follicular conjunctivitis and trachoma. In about 70 per cent. of severe cases of trachoma he has found swelling of the lymphatic glands of the neck and axilla. In adult life and old age, conjunctival affections speak for the uric acid diathesis, if local irritation, such as dust, can be excluded. E. describes, as peculiar to this condition, a limited inflammation of the conjunctiva and fornix accompanied by irritation of the scleral conjunctiva, with varicose and enlarged blood vessels.

Relapsing ulcers and parenchymatous infiltration of the cornea occurring in diabetes are believed by E. to be due to glycogenic degeneration from partial stoppage of the circumcorneal capillaries. Neuro-paralytic keratitis is an expression of the cachexia and a warning of diabetic coma. In a case of marantic senile keratitis, E. was able to stop the process for a long time by the use of Japanese hot box, collyrium of physostigmin and painting of each ulcerative spot and the neighboring conjunctiva with physostigmin. In diseases of the uvea and glaucoma he lays stress upon the gouty

diathesis, and shows that irido-cyclitic exudations are thus caused in gouty subjects after cataract extraction, and this event is to be thus ascribed where infection can be excluded. Recurrent bleeding and opacities in the vitreous are a form of the hemorrhagic diathesis, especially in severe disturbances of nutrition (tuberculosis, etc.) Affections of the pupillary movements and of the accommodation occur in diabetes, such as in the beginning of the tabes, and as an early symptom of ischuria. Increase of hyperopia with each increase of glycosuria as well as absolute or relative reduction of the accommodation has been observed in diabetes.

In diseases of the optic nerve and retina, E. gives a review of the changes which are known to occur in high grades of anemia, pernicious anemia, leukemia, pseudo-leukemia and diabetes. E. makes a distinction between idiopathic and secondary anemia. In the first form, the retinal hemorrhages do not occur at all, or are of small extent. In the latter, the retina becomes greatly edematous and extensive bleeding occurs. In pernicious anemia retinal hemorrhages are always to be dreaded, and the diagnosis should be rendered plain by examination of the blood. E.'s own observations show that a restricted degeneration occurs at the macula lutea, consisting of small, whitish, sharply reflected spots arranged sometimes in the form of a cross. In these the central vision is diminished and there may be a central relative scotoma. Sometimes these spots run together into a larger one, and small point-like hemorrhages may occur. Under diseases of the lens, E. dwells upon the relations between the uric acid diathesis and opacities of the lens. The nutrition of the lens is interfered with through changes in blood vessels and capillaries of the middle part of the uvea, occurring in uric acid diathesis, or through atheroma of the vessels so often observed in gout, or through both causes. The description of the diseases of the orbit, as well of the nerves and muscles, contains nothing especially new.

H. V. W.

TREATMENT OF EYE DISEASES CAUSED BY TOXIC SUBSTANCES.

EVERSBUCHS, O. (*Behandlung der bei Vergiftung vorkommenden Augenkrankheiten*. Penzoldt u, Stinzing's Handbuch der spec. Therapie innerer Krankheiten. Bd. II., Abtheil. 3, p. 673-692.)

A description of the nerve tissue changes together with those of the eyegrounds connected with the amblyopias of intoxication is given. The clinical aspects, causes of the various toxemias and the differences of diagnosis, prognosis and treatment, are clearly described. Then follow diseases of the ocular nerves and muscles, after which the diseases of the eyelids, conjunctiva, cornea; lens, etc., are treated from the same standpoint. He concludes with the injuries produced from the use of medicines used locally to the eye. It is this subdivision, which is especially interesting, as herein he describes the dangers which medical procedures can affect the eye and gives precautionary rules by which such effects may be prevented.

H. V. W.

THE RELATION OF EAR DISEASES TO EYE AFFECTIONS.

ROHRER, Zürich. (*Das Verhältniss der Ohrenkrankungen zu den Augenaffectionen.* Klinische Vorträge aus dem Gebiete der Otologie und Pharyngo-Rhinologie, Herausgegeben von docent Dr. Haug, München, 1897.)

In the preface R. dwells upon the morphology of both sense organs, showing that they are much the same in the beginning, being developed by a folding in of the ectoderm. In general they are similar; the epithelium of the auditory bud being compared with the retina, the ear capsule, to the eye capsule, and especially the soft inner parts which are similarly richly supplied with blood vessels to the choroid; the bony labyrinth capsule and its periosteum to the sclera. Waldeyer compares the sclera to the bony semicircular canals and draws a parallel between the retina and the organ of Corti. In the second part the author shows the relation between ear and eye diseases, beginning with acute and chronic affections of the naso-pharynx and the neighboring cavities, which ascend through the eustachian tube and lacrimal canal to the cavity of the drum and conjunctival sac. The irradiation of neuralgia is also described. He explains the tubercular, lupus, syphilitic and dyscrasic affections and the malign tumors, (carcinoma, etc.), which, although seldom, may go from the eye or ear to the nose. Chronic forms of retinitis affect the middle ear and conjunctiva, especially is this the case in atrophic rhinitis, in which the ulcers and crust formation lead to severe secondary diseases of the eye and ear, such as epiphora, dacryo-cystitis, or otitis media purulenta, local treatment of these eye and ear affections is without result unless the nasal cause is cured. Thrombosis of the orbital vein has been caused by nasal furunculosis. The reflexes coming through radiation and through the nose are described. Among these are asthenopia, paralysis of accommodation, concentric contraction of the visual fields, blepharospasm, neuralgia, which is usually connected with the teeth, causing nervous otalgia. Inflammation, empyema, hydrops, etc., of the communicating cavities of the nose and the upper jaw, frontal and ethmoidal bones, cause similar changes in the eyes and ears.

In the eye is observed neuralgia, contractions of the visual fields; mechanically through pressure and displacement exophthalmos paralysis, optic atrophy and ptosis or even full amaurosis; through malignant disease of the ethmoid affecting the optic nerve, chiasm and optic tract. Interstitial keratitis is intimately connected with severe defects of hearing and is usually due to hereditary syphilis. The greatest and most striking connections between defects of both special sense organs are found in the course of neuro-pathologic functional defects. The richness of the ear in nerve connections with its connection with the vaso-motor nerves, the vagus and sympatheticus and the several motor sense ganglia, the trigeminous, facialis, glosso-pharyngeal and the correlation of the reflex centers of the opticus, acusticus, and finally the intimate relation of

both nerves upon the sense of equilibrium gives us an explanation for the commonest synergies in physiologic and pathologic territory. R. recommends examination of the fundus of the eye for the diagnostic-prognosis and therapy of many ear diseases and finally explains the relationship of these organs of special sense to those diseases.

H. V. W.

THE OCCURRENCE OF SHARPLY DEFINED ECTASIA IN THE FUNDUS AND PARTIAL COLOR BLINDNESS IN HIGH GRADES OF MYOPIA.

WEISS, LEOPOLD, Heidelberg. (*Ueber das Vorkommen von Scharfbegrenzten Ektasien im Augengrunde und über partielle Farbenblindheit bei hochgradiger Myopie*). Fifteen illustrations in the text and 8 plates. Printed by J. F. Bergmann, Wiesbaden, 1897; 72 pp.); price 5 marks, (\$1.25.)

This brochure is an evidence of the power of elaboration of the German mind. Sharply defined ectasia in the posterior pole of the eye occurring in high grades of myopia is rather uncommon. The cause of most cases of myopia is elongation of the axis of the eye. The protrusion of the posterior part is not usually sudden but gradually merges from the normal curvature. During the year 1896, he collected the history of 310 cases of myopia, of which 224 cases were under 6 D. In 3 cases there was myopia of 20 D. or more; 86 of the cases were from 6 D. upward. In 3 cases of myopia of 15, 18 and 20 D., there was a sharply defined ectasia. In 10 cases there was a dark curved line noted without there being sharply defined ectasia, but in the other cases, which are reported in full in this brochure, this clearly defined line was prominent in the nasal side, being the place where the ectasia commenced. The width of this curved line seemed to change according as the ophthalmoscope was handled, and seemed to be more or less of a shadow formation. Inside of this line the retinal vessel parallax was readily observed and for a clear view of the ectasia a stronger concave glass was necessary than that for the peripheral portion. In some cases the dark stripe formed the edge of a large ring staphyloma or conus, but as a rule it was somewhat removed from the edge of the conus. The appearances of the fundus of the various cases, their history and the visual fields are fully and interestingly described. Three colored plates of the fundus are excellent; the two plates in black and white are not so well done. The visual fields show peripheral contraction and enlargements of the blind spot due to the large conus; scotoma due to chorio-retinitis centralis and encroachment of the staphyloma upon the macula; scotomas for colors and contraction of the field for colors or even complete color blindness.

H. V. W.

A GUIDE FOR THE ESTIMATION AND CALCULATION OF THE AMOUNT OF DAMAGE TO EYES FROM ACCIDENTAL INJURIES.

MAGNUS, H., Breslau. (*Leitfaden f. Begutachtung u. Berechnung v. Unfallsbeschädigungen der Augen*). J. U. Kern, Breslau, 1897; 180 pp.)

Among other duties it is often the portion of the practitioner of

medicine to determine the amount of physical damage sustained from accidents. Definite opinions regarding the amount of vision lost by an accident may be given by the oculist, when called in court, as a technical witness in suit for damages and other civil processes, in adjustment of damages for accident insurance, etc. Valuable aids for this determination may be found in the work of Groenouw's reviewed by the editor in the ANNALS OF OPHTHALMOLOGY, p. 1313, 1896, and in this book of Magnus'. The author does not claim to give hard and fast rules, although throughout the work the amount of damages seems to be arrived at by mathematical processes of considerable extent. The amount of damage sustained by the individual from certain injuries and certain losses of vision must vary with his trade and conditions in life. In this work the author gives the German law which went into effect the 6th of July, 1894, which is called the Accident Insurance Law, paragraph five of which is as follows: "The insurance should be in proportion to the accident. The amount of damages in case of accident should consist in (1). The cost of the treatment from the beginning of the 14th week after the accident. (2) An income from the beginning to the 14th week after the accident for the entire time that the person is disabled." The methods of reckoning the amount of damage to the working capacity of the individual given by Zehender, Groenouw and Heddäus are compared, after which M. explains at length his method of reckoning the amount of injury to vision; considering first the former vision and the business of the person and the amount that this is injured. Determination of the damage caused by impaired vision is worked out according to his own algebraic formula. A table is given of the various trades and industries requiring the best vision, and another of those requiring less vision. The valuation of the amount of injury to vision after all sorts of accidents to the eye, is described at length. The work is replete with tables and formulas for accurate determination. It is illustrated by a number of charts in colors showing the effect of injuries involving contractions or hemianopia of the visual fields. If this work were translated into English, it would occupy a unique position, as there is nothing like it in our language, and the editor believes that this field might well be discussed from our standpoint by some American writer.

H. V. W.

TRANSITORY AMBLYOPIA.

ANTONELLI, ALBERT. (*Die Amblyopie transitoire*. Beitrag zum Studium der Sehstörungen bei den nervösen Krankheiten. Authorized German edition. Edited by Dr. Otto Vieser. 119 pages, 4 charts, and 19 illustrations in the text.)

This monograph deals with those disturbances of vision which are commonly known as flickering scotoma, ophthalmic migraine, teichopsia, which the author classes under the general name of transitory amblyopia, and describes them under the following divisions:

- (a) Flickering scotoma form.
- (b) The so-called ophthalmic migraine.

(c) The hemianopic form and concentric contraction of the visual field.

(d) Transitory central amblyopia or amaurosis.

There are other cases which do not come directly under any one of these classifications, and are described as mixed forms.

In the first chapter, the several forms of transitory amblyopia and the literature on the subject is symptomatically given. In the second chapter those nervous disturbances are described which accompany transitory amblyopia. Under these are migraine, aphasia, vertigo, epileptiform disturbances (which consist of certain disturbances of sensory and motile function and transitory insanity, the latter of which has been very seldom observed). Then the relations of transitory amblyopia to a number of nervous diseases, which may have these for a symptom, are shown. Here are neurasthenia, hysteria, classical epilepsy, partial epilepsy, tabes and paralysis. He shows that transitory amblyopia may be a prodromal symptom of paralysis and of tabes.

The third chapter is devoted to the pathologic physiology of transitory amblyopia. The author definitely states that the disturbances of vision must be caused from disturbances which take place in the visual cortex. All the forms of transitory amblyopia can be explained from this point of view. The close of this chapter deals with the nature and character of the cortical disturbances, which are shown by the author to be largely dynamic and to consist of disturbance of the circulation due to vaso-motor cramp in the cortical areas which cause temporary anemia, and the aforesaid disturbances of function. He closes with a resumé of the etiology, prognosis, course and treatment of transitory amblyopia. The language of the author is especially clear and his theme well handled. A perusal of the original is much to be recommended. H. V. W.

THERAPY OF ULCUS CORNEAE SERPENS.

SCHMITZ, R., Bonn. (*Die Therapie des Ulcus Corneae Serpens*. Printed by Carl Georgi, Bonn, 1897,) reports 261 cases (25.4 per cent. of all eye cases in the Eye Clinic of Bonn, occurring between the years 1889 to October, 1896.) This corneal affection comes in 5.4 per cent. of all cases, more commonly in men (6.3 per cent.) than in women, (4.2 per cent.) Trauma of the cornea is the principal cause. It occurs commonly in workers who are exposed to particles of foreign bodies flying into their eyes in their trades; 70.6 per cent. of men gave a traumatic history, of whom 52 per cent. had pieces of stone, 25 per cent. wood and 10 per cent. wheat chaff or iron splinters. In women 50 per cent. were from wood, 25 per cent. from wheat spears or chaff, 10 per cent. from stone or dust particles and 10 per cent. from cow's tails. It usually occurs in men on the right side. In 53 per cent. in the right, and in 47 per cent. the left. In women 49 per cent. the right, and 51 per cent. the left. In the case of stone workers the right eye was no more commonly affected than the left.

Small ulcers are treated by atropin and heat, lacrimal cases are

attended to in the beginning of treatment. Larger ulcers are operated upon by the Saemisch method, the edges of the wound being separated each day and the aqueous humor and pus removed until the inflammation is mostly subdued. Cauterization is only done when there is no, or a very small hypopyon, and in 10 out of 22 cases has no result; ordinarily, when the ulcer is 5 mm. wide, only the keratotomy is done and usually suffices to cure the case. There is a difference in the healing of *ulcus corneae serpens* in men and women, as in men 43 per cent., and in women only 27.7 per cent. are cured. The women usually come too late with complicated lacrimal disease. In 52 ulcers occurring in 35 men operated upon, after operation 17 per cent. healed with leucoma but without anterior synechia. The others were all complicated, 87 per cent. healed and 7.5 per cent. total leucoma or phthisis anterior occurred, and 5.5 per cent. had panophthalmitis. In men the results were much better. In 178 cases, 86 were operated upon, of which 71 per cent. were incidentally helped, 36 per cent. healed with macula but without anterior synechia. Healing occurred in 94.2 per cent., only in 4.2 per cent. did the process continue, and in 1.1 per cent. panophthalmitis set in. Secondary glaucoma occurred only in 5 cases out of 138, which is contrary to the doctrine of Sachsaler (*Beitrage z. Augenheilkunde*, XXII). He criticises S's. method of cauterization with small paracentesis, as the hypopyon can then only be removed by forceps, and anterior synechia is not prevented. Cauterization is only used in the Bonn Eye Clinic in cases which have thin and absorbable hypopyon, where the ulcer is not large and the edges are greatly infiltrated. The dangers of galvano-causis are in the unsafeness of deep operations, in the influence of the heat in coagulating the aqueous and the causation of large leucoma. He has never had cause for sorrow in a large experience of twelve years regarding a corneal section made for ulcer, but has had bitter experience in his first years of practice from the use of acids and cautery, although they had not caused panophthalmitis. If cautery is used once or twice without result, a section may always be properly made. All other methods are less valuable than the Saemisch section.

H. V. W.

**"A PRACTICAL GUIDE TO THE EXAMINATION OF THE EYE,"
FOR STUDENTS AND PRACTITIONERS.**

SNELL, SIMEON, F. R. C. S., Edinburgh. (177 pp.; 80 illustrations. Young J. Pentland, publisher, Edinburgh and London, 1898.)

Although there are few of our modern text books that do not furnish a chapter on the "Examination of the Eye," either under the heading of General Considerations or the above title, we doubt if any of them is quite as thoroughgoing in wealth and arrangement of material as this volume. Designed primarily for students, the author's style is direct, yet easy and pleasing, and the student is not burdened with the discussion of moot points in ophthalmology, but shown rather the application of the better known facts of our science.

Nine chapters are given to outlining the author's ideas as follows: 1. Introduction; 2. External Examination of the Eye; 3. Mydriatics and Miotics; 4. The Ophthalmoscope; 5. Testing the Sight; 6. Anomalies of Refraction; 7. Field of Vision; 8. The Movements of the Eyeball; 9. Simulated blindness.

It is pleasing to note the emphasis laid in the introductory chapter on the diathetic conditions that frequently underlie diseases of the eye. The description in the remaining chapters of the methods and means used in recognizing ocular anomalies and disorders is admirable. Nothing is omitted that could much profit the student and nothing discussed that could befog his understanding. The chapter on muscular anomalies is particularly praiseworthy. It is the best exposition of this perplexing question from the student's standpoint that we have seen for a long time, and will well repay careful study. It seems a strange oversight that the use of miotics in glaucoma is not referred to, and we are inclined to believe that it was due to a "lapsus memoriæ" rather than to intentional omission. The author's preference is for the concave mirror in retinoscopy, with the source of light above and behind the patient's head; this method has given way in this country to the plane mirror at one meter with the source of light close to the surgeon's eyes. However, in this as in many other minor details in ophthalmology, the surgeon's caprice more than any other factor will dictate his choice in such matters. The point is that the principles that underlie the shadow test be known, in which case it matters little whether the plane or concave mirror be used.

The lavish and pointed use that is made of illustration in the volume indicates how fully the author appreciates the necessity of making all books for students and beginners in any science as nearly object lessons as possible. There are 80 illustrations in 177 pages, which means practically one on every other page. The type, paper and binding are unusually good.

We welcome the new comer. It is a book with a future. W. R.

RETINOSCOPY (OR SHADOW TEST) IN THE DETERMINATION OF REFRACTION AT ONE METER DISTANCE, WITH THE PLANE MIRROR.

THORINGTON, JAMES, M. D., Adjunct Professor of Diseases of the Eye in the Philadelphia Polyclinic and College for Graduates in Medicine, Etc. Second edition, revised and enlarged; 38 illustrations, 12 of which are colored. P. Blakiston, Son & Co., 1898.

The student in ophthalmology is earnestly advised to make himself conversant with the contents of this book. His task is not a difficult one, and we have no hesitation in saying that a better prelude to, or accompaniment of, the principal work in the refraction room has not been written. Within 70 pages are contained full directions for securing lights and mirrors of the most approved patterns. The correct relative positions of patient and observer and accurate interpretation of the changes in illumination in the pupillary

area, are set forth. The book is written in an easy clear style that is worthy of imitation by other authors. Theoretic discussions and other cumbersome matter, unattractive to the student, are omitted, and attention given only to those portions of the subject that have a direct bearing upon the essential points in determining the diagnosis of ametropia. Retinoscopy is today recognized as a method of diagnosis indispensable to the thoroughly equipped refractionist, and the preference is conceded, at least in America, to the use of the plane rather than the concave mirror. Thorington's book fulfils the objects for which it was created. The early exhaustion of the first edition proves its popularity. The second edition, published in less than a year after the first, contains some new material and well executed colored illustrations, and will prove as valuable as its predecessor to polyclinic students and other beginners in the study of ophthalmology. It is well printed, free from typographical errors, and neatly bound.

H. F. H.

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No. 3.

HEREDITARY OPTIC NERVE ATROPHY. A REPORT OF THREE CASES, REPRESENTING MEM- BERS OF THREE SUCCESSIVE GEN- ERATIONS AFFECTED BY THE DISEASE.*

BY WM. CAMPBELL POSEY, M. D.,

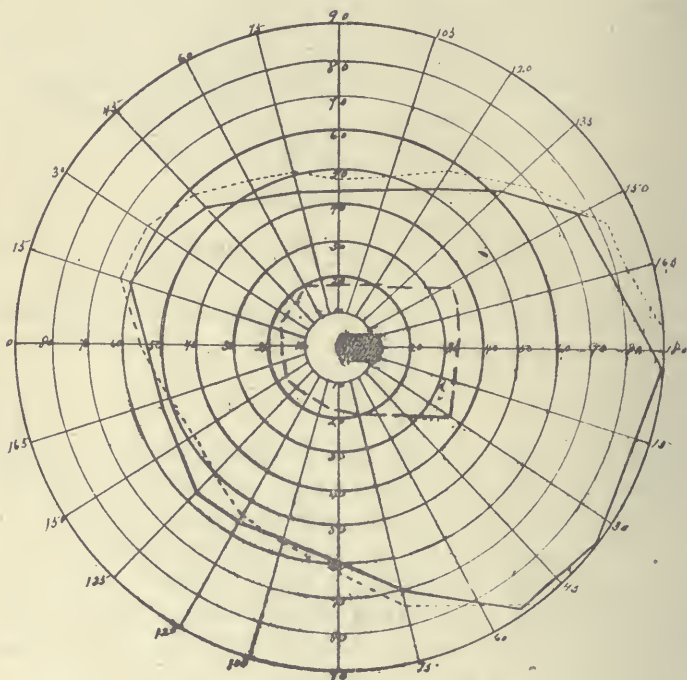
ASSISTANT SURGEON TO THE WILLS' EYE HOSPITAL; OPHTHALMOLO-
GIST TO THE HOWARD AND EPILEPTIC HOSPITALS.

ILLUSTRATED.

CASE I.—J. H. S., clerk, age 25, consulted me October 29, 1897, on account of failing sight in one eye. He said that his eye had never given him any trouble until three weeks previously, when he noticed motes and a mist before the right eye, and a slight pain over the eye after its prolonged use. He acknowledged having had a slight attack of gonorrhea eight years previously, but denied further venereal taint and said that he did not indulge in excessive venery. He had never had rheumatism. For the past five years he had smoked five to eight cigars daily and had chewed at times, but never to any extent. He drank an occasional glass of beer and whisky, but at comparatively rare intervals. He had always been of a nervous temperament, and suffered from dyspepsia; he had also had bilious attacks at times, colicky pains followed by vomiting bile, but he could not remember ever having been jaundiced. His bowels were regular.

*Presentation of cases at the March meeting of the Ophthalmological Section of the College of Physicians of Philadelphia.

At the time of first examination—O. D. V. = 5/30; O. S. V. = 5/5. Read type No. I. D. with O. D., and type No. O. 50 D. with O. S. The ophthalmoscopic examination revealed the following: O. D. media clear, disc vertically oval, its edges being veiled by the swollen retina, more especially to the nasal side. The disc was hyperemic, the central lymph channels full, the retinal arteries and veins were also full and tortuous, especially the latter. The retina was hazy for several discs diameters about the disc



R. Case 1.

and the retinal reflexes were very marked, occasioning the characteristic "watered silk" appearance of that membrane. There was compound hypermetropic astigmatism of 1.5 D. — O. S.; media clear; disc vertically oval; slightly hyperemic, and its nasal edge faintly obscured by the retinal striations. Retinal arteries were normal, but the veins were rather fuller than normal, with their light reflex broadened.

His fields exhibited the following:

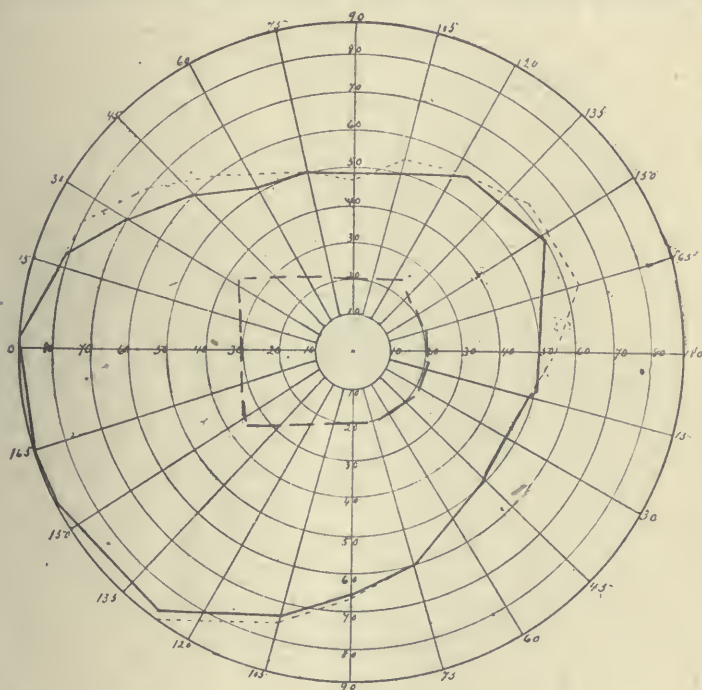
Outer circle represents white object 10 mm. square.

Inner circle represents red object 10 mm. square.

Absolute central scotoma.

A short inquiry eliciting the information that an uncle and a great uncle had very poor vision, the nature of the disease was at once suspected, and the request made that as many members of his family as possible present themselves for examination.

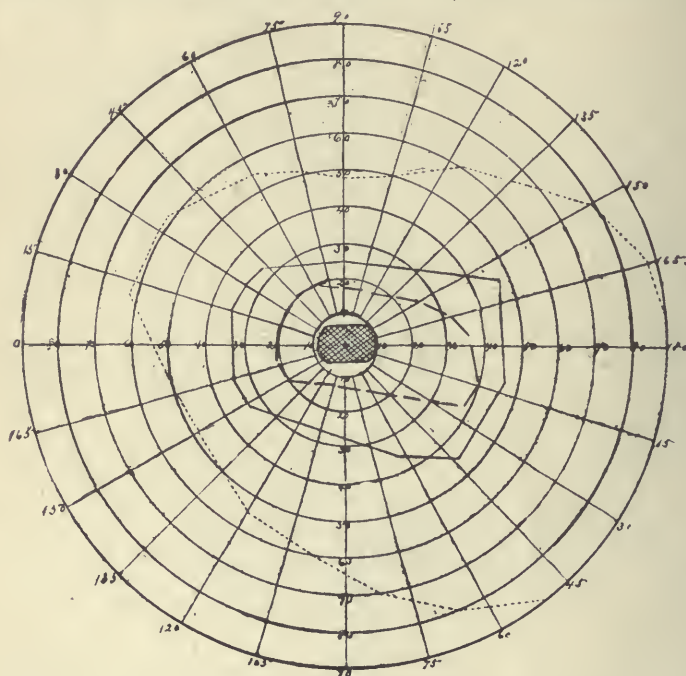
An examination of his urine was made by Dr. T. G. Davis, of Bridgton, New Jersey, and found to be normal. I am indebted to this gentleman also for his aid in enabling me



L. Case 1.

to complete the family history, and for his intelligent oversight in the case. The patient was advised to stop his tobacco, a proper dietetic regimen prescribed, and he was given bichloride of mercury, gr. 1/20 three times daily. At the end of a week the bichloride was withdrawn, and he was placed on ung. hydrarg. drachm 1 twice daily for three weeks, when the mercury was substituted by potassium iodide in ascending doses.

During the first three months the vision in the right eye has steadily decreased, until now it equals but $1/60$. The vision in the left eye continued normal until Jan. 15, 1898, about twelve weeks after the first symptoms manifested themselves in the right eye, when it began to deteriorate, until it now equals $5/40$. The fundi have also changed in appearance; in the right eye the retinal vessels are no longer so full and tortuous, but more cord-like and taper as they enter the disc; the retinal reflexes and the choking of the lymph streams on the disc are not so marked, and the swelling of the disc has in a measure lessened. As



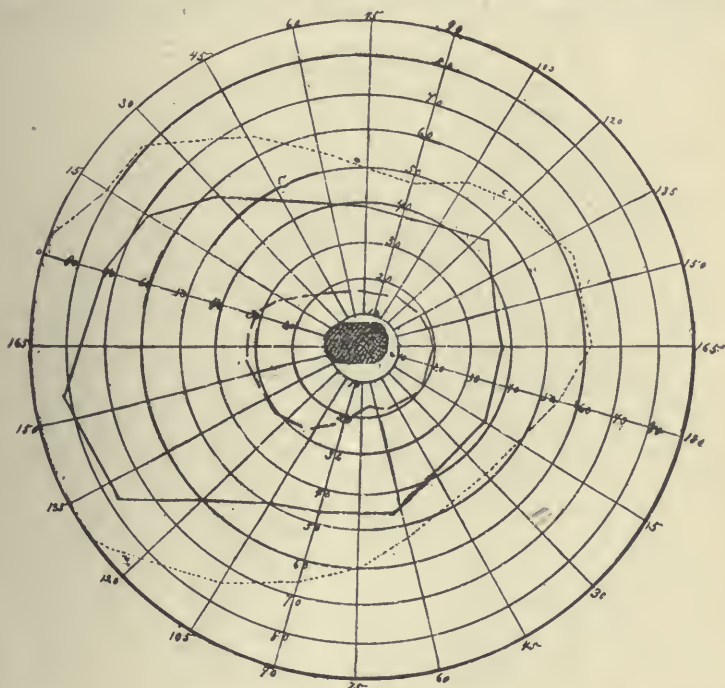
R. Case 2.

the neuritis subsided in the right eye it increased in the left, going through precisely the same changes as were observed in the fellow eye.

The fields have been taken at regular intervals. The peripheral fields have remained normal in both eyes both for form and color, but the scotoma in the right eye has increased in size until now it cover fixation and extends somewhat irregularly to about 10 degrees about fixation.

As yet the scotoma in the left eye is not absolute, there being merely a darkening of all colors (more especially, however, for red and green,) at the fixation point and into the temporal field to about 5 degrees. The iodide has been continued, so that now he is taking three hundred grains daily to lessen, if possible, the edema of the optic nerves.

CASE II.—H. B. H., farmer, age 41 years, maternal uncle of Case I. He stated that his vision first began to fail when he was 24 years of age, that of the right eye being

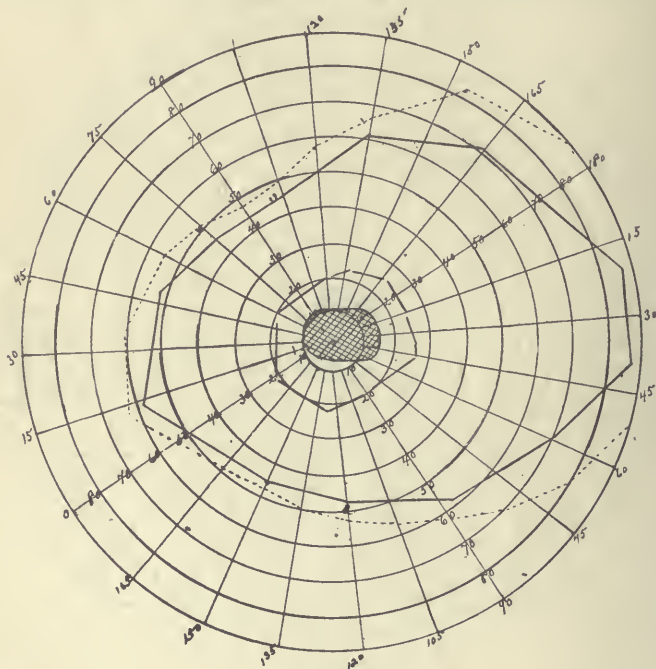


L. Case 2.

first affected, although that of the left followed shortly afterward. He said also that sight deteriorated so rapidly that in six weeks he could not read fine print. He had never had any venereal disease or rheumatism, and with the exception that he had suffered greatly from dyspepsia for many years, his health had always been remarkably good. At the age of 16 years he began to smoke on an average of three cigars daily, which he has continued to the present time, and for the past five years he has chewed

about two plugs of tobacco weekly. Shortly after he noticed his loss of sight he consulted the late Dr. R. J. Levis, who gave him powerful doses of strychnia but did not, the patient says, curtail his use of tobacco.

Upon examining his fundi I found the signs of atrophy of both optic nerves. Both were grayish white, the retina everywhere hazy, and his blood vessels were much reduced in size. There were shallow atrophic excavations on the outer halves of both nerves; eyes almost emmetropic; O. D. V. = $1/3/50$; O. S. V. = $1/3/50$. There was divergent strabismus in the right eye of about 20° , the



R. Case 3.

pupils were 3 mm. in size and reacted well to light and accommodation stimuli. The fields were as exhibited:

Outer circle represents white object 20 mm. square.

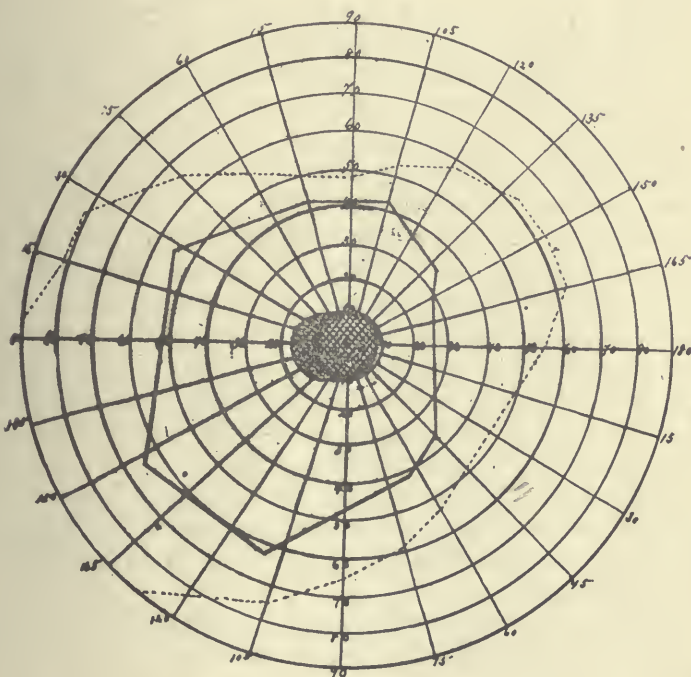
Inner circle represents blue object 20 mm. square.

No other colors of only 20 mm. in size can be recognized.

Absolute central scotoma.

CASE III.—N. B., age 61 years. Maternal great uncle of

Case I and maternal uncle of Case II; first noticed that his sight began to fail when aged 30 years, and so rapid was the loss that he was soon unable to read. He denied specific infection. He said also that he had never chewed, but added that he first began to smoke when aged 15 years, on an average of two cigars daily, which he continued for 10 years. At the end of that period he relinquished the cigars for a pipe, of which he has smoked on an average of five times daily since. He consulted the late Dr. P. D. Keyser 30 years ago, who advised him to stop smoking and gave him strichnia.



L. Case 3.

The ophthalmoscope now reveals atrophic discs in both eyes, the nerves being grayish white and the retina everywhere hazy. The retinal vessels are much reduced in size, particularly the arteries, and there are large atrophic excavations which embrace the outer two-thirds of both discs.

O. D. V. = 3/50, O. S. V. = 2/50; pupils equal to $2\frac{1}{2}$ mm. in size. Irides respond rather sluggishly to light and accommodation; fields are as exhibited.

Outer circle represents white object 20 mm. square.

Inner circle represents red object 20 mm. square.

Absolute central scotoma.

As a result of my inquiries regarding any family traits or illness which might have acted as casual factors in the disease, I learned that nearly all the members were "nervous," easily excited and depressed, and that most of them suffered from dyspepsia; indeed, Cases I and II would attribute their ocular condition in large measure to this latter ailment. There is no history of insanity in the family.

Hereditary optic nerve atrophy is a rare disease, and any additional observations regarding it cannot be without value and interest; and I am particularly glad, therefore, of the opportunity afforded me this evening of presenting to you three cases, representing as many different stages of the disease and enabling us to study it as it appears in three successive generations of the same family. The first case has been under my observation from practically the initial stage of the neuritis, and I have been able to carefully observe the changes in his fundi week by week, and to note the different phases of the neuritis which have been so accurately described by Norris (1). This author divided the changes in the optic nerve into three stages:

1. The earliest, the stage of cloudy and edematous swelling with a congested and hazy disc.

- 2, The stage of gray discoloration, with less haze and swelling, and with bright light reflexes, silvery and yellowish white lines accompanying, and in some cases overlying the retinal vessels.

These he considers due to thickening and clouding of the walls of the capillary vessels of the retina.

3. In the third stage the reflexes are less marked, the vessels diminished in caliber and the nerve tissue of an opaque gray color—in a state of pronounced atrophy.*

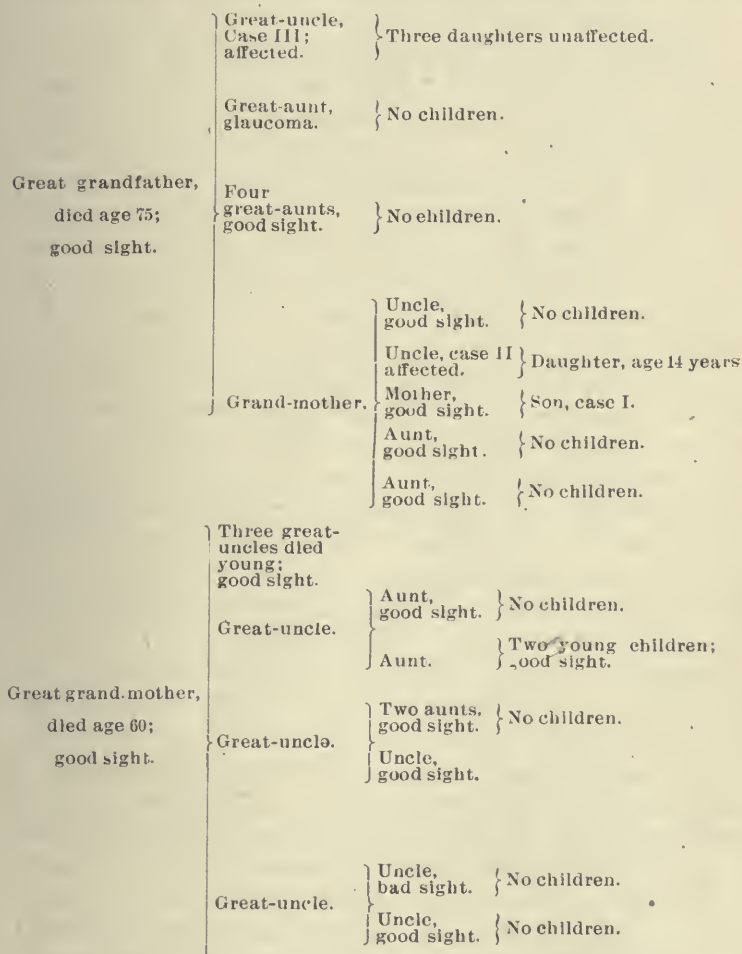
The distribution of the disease is of interest:

So far as is known Case III, the great uncle of the young man who first consulted me, was the first of his family to lose his sight; but as he is unable to give me,

*Habershon. Trans. of the Ophth. Soc. of the United Kingdom, p. 197.

and as I am unable to obtain from other sources, any information regarding the eyes of his ancestors, other than those of his father and mother, it is quite possible that other members of his family may have been similarly affected in earlier generations.

As shown by the accompanying diagram Case III had



six brothers, all of whom had good sight; and six sisters, with issue, however, in but a single instance; so that the possibility of transmission of the disease down the female side in that generation was prevented, save through one member. This woman, the grandmother of Case I, had

two sons, one of whom has excellent sight, whilst the other is affected, (Case II.)

She had three daughters, also, all with good sight, and, as in the preceding generation, the further transmission of the disease was blocked by the failure of any but one of them to have children, and the child of this member was affected, (Case I.)

Although, in comparison with the cases previously reported of hereditary optic nerve atrophy, three members seem but a small number to be affected in any family during three generations; yet, if the disease transmits itself in the manner usually described, by means of the females to the male members—the former escaping—it is evident from the foregoing that there were practically no other avenues for its transmission in this family, due to the lack of issue in all but one of the family in each generation.

The disease manifested itself in all three of these cases between the ages of 25 and 30 years. This is rather a later period than usual, and it is further worthy of remark as it appeared in all three at the same age. Habershon (2) found that in 65 cases tabulated by him the majority were of the age of puberty, or thereabouts, although 11 occurred after the thirtieth year.

In Case I there now exists a large absolute central scotoma in the right eye and a relative one in the left, with the peripheral fields quite normal in extent in both eyes. Although the periphery of the field in his uncles' eyes have not escaped, but show a concentric contraction, their extent for form is still quite great, notwithstanding the inflammatory and cicatricial changes which have occurred in the nerves of the older men; in the one over a period of 10 years and more, and in the other of 30 years or more, respectively. Nevertheless, the type of the visual defect is still observed, for it can be readily ascertained in both cases that vision is much more obscure at the fixation point than 30 degrees away from it.

In Case I, mercurial enunciations were pushed to pytalism, followed by massive doses of potassium iodide, in the hope of improving the condition of the nerves by lessening their edema. I was strongly tempted to try free

diaphoresis, as Graefe (3) cites an instance where a laborer in a sugar refinery, a sufferer from the disease, always found marked improvement in his vision after the profuse perspiration entailed upon working in a temperature of 30° F. As the vision in one of Norris' (4) cases was always made worse by perspiring, I thought it best to omit this procedure. Temporal pains were complained of upon several occasions, but were promptly controlled by a blister on the temple. As the blister seemed to exercise a slightly beneficial effect upon the vision, it was repeated a number of times advantageously. So soon as the atrophic stage sets in and the connective tissue begins to proliferate in the nerves, I shall employ strychnia and inhalations of nitrite of amyl in the hope of reducing the subsequent cicatricial contraction to a minimum.

In the study of these three cases great interest must attach itself to the influence which tobacco may have had in the causation of the neuritis, for all three were smokers. In Case I, the young man who came first under my observation, there was a history of a not immoderate use of the drug, for I suppose that five to eight cigars daily, while rather large, would not be considered excessive; and he never smoked until he was 20 years of age. Case II might also be considered a moderate smoker, for he smoked on an average of but three cigars daily, and did not begin to chew until five years ago. Case III began to smoke when he was 15 years old, but confined himself on the average to two cigars daily until he was 25 years of age.

Although all three were addicted to tobacco, it would appear that none indulged in it to a degree sufficient, without the presence of other factors, to inaugurate disease of the optic nerves, while the age at which the disease manifested itself would also militate against the idea of uncomplicated tobacco amblyopia. The possible influence of tobacco, however, in the etiology of hereditary optic nerve atrophy where the neuritis is retro-bulbar in type must always be considered; for, while in all likelihood there are other predisposing agents, it is probable that tobacco may be the exciting cause which originates the disease in many instances. Leaving this phase of the sub-

ject for moment, let us consider what the predisposing factors may be.

In his original communication on hereditary optic nerve atrophy, Leber (5) noticed that the class of individuals attacked by the disease belonged distinctly to a marked neuropathic type, for he found in many of them a general disposition to pathological disturbances of the nervous system, such as headache, vertigo, tremors, numbness of limbs and even epileptiform attacks.

Although a number of other cases have also been cited (Travers, Graefe, Story, De Kiermaecker,) where there was insanity or epilepsy in association with the ocular disease, yet we cannot, it seems to me, in the light of our present knowledge of central nervous disorders, and from the careful study of cases of the disease which have come under observation, but agree with Habershon that this occurrence cannot be regarded as more than an evidence that these families are particularly liable to disturbances of the nervous system.

Consanguinity also, although traced in the grandparents by Leber and Mooren, each in one instance, can scarcely be said to exert any influence whatever upon the disease.

The ability to refer a malady to a structural defect is always attractive to most of us, so that the statement of Berger (7) that a number of cases of hereditary optic nerve atrophy are due to an irregularity in the growth of the sphenoid bone, incited at once a careful study of the evidence which was offered by him as proof of this assertion. Beyond citing a number of cases, however, reported by different authors, of blindness appearing in early childhood, which was due to pressure on the optic nerves at the back of the orbit, in some by bony outgrowths, the result of inflammatory conditions, in others by abnormally small foramina, it seems to me that the author has given no definite information to substantiate his statement.

The conditions existing in hereditary optic nerve atrophy are so unlike those in the cases just referred to that further reference to them is unnecessary, although one conclusion may be drawn from them which may have some value in connection with the subject of this paper; and that is, that optic atrophy in early life was frequently found

to be associated with skulls of the "tower type," the scapho and dolichocephalic varieties, where the sagittal meridian is too short in proportion to the height of the skull. While Berger, does not seem to give sufficient proof to support his hypothesis, nevertheless the theory of the atrophy being due to an irregularity in the growth of the sphenoid appeared so tenable that I was loath to relinquish it, the more so as other possible etiological factors seemed absolutely lacking. The sphenoid bone is the keystone of the skull, and the numerous changes which the orbit, as well as the other cavities of the skull during life undergo, are chiefly occasioned by the growth of this bone. It contains the optic foramina, and any irregularity in its growth might readily occasion pressure upon the optic nerves in their passage through these, and excite the characteristic lesions of the disease. It has also been shown by Virchow that the development of the sphenoid is often not attained until very late in life, which would account for the failure of the disease to appear at times until late in life; although the age at which hereditary optic nerve atrophy generally manifests itself corresponds with the period of usual development of the sphenoid.

So long as post-mortem examinations fail in cases of hereditary optic nerve atrophy, it will be impossible to arrive at any proper conclusion regarding the true genesis of the condition, but it certainly seems tenable that an irregularity in the growth of the sphenoid might occasion pressure upon the nerves at the foramina and produce this form of ocular lesion.

Unfortunately it is impossible, I am told, by measurements of the skull to judge accurately of the form and size of the bones composing its base, so that little can be gained by a study of the external configuration of the skull in these cases; as it has been definitely proven, however, that optic atrophy is sometimes found associated with so-called "tower skulls," the presence of this shaped skull in hereditary optic nerve atrophy should always excite the suspicion of its being a possible causal factor in the production of the disease.

It is of interest in this connection to note that the skulls

of Cases I and II border on this type. Their occiputs are illy developed, and their height appears disproportionately great to their breadth. I am told, also, that the father of Case III had a similar shaped head and that Case I bears a striking physical likeness to this great-grand-parent.

Having considered the different causes which have been offered as factors which predispose toward the disease, it is necessary to refer to those which have been supposed to act as exciting agents.

Regarding the influence of tobacco as one of these, I cannot do better than subscribe to the conclusion of Habershon upon this subject, for they fully explain, I think, the relationship which the drug bears to the disease. They are as follows:

“That the toxic effect of tobacco (and possibly of alcohol, though there is no proof that this alone will produce atrophy) will, I think in the cases of individuals with this peculiar nervous diathesis already referred to, produce, instead of the milder and retrogressive form of amaurosis (which is common in persons with merely a susceptibility or idiocyncrasy to tobacco), a progressive neuritis leading to optic atrophy and a failure of vision, which, though it comes to a standstill at a certain point, seldom if ever becomes improved when the exciting influence is cut off,”

I am not so ready, however, to agree with his conclusion regarding the influence of the sexual system in the production of the disease. He claimed for this:

“That amongst others, the influence of the sexual system is probably shown by the occurrence of the disease in a large number of the cases at the period of life at which disturbances of the nervous system most commonly result from this cause, namely, at or about the age of puberty, and at the age (in women) when the sexual functions cease (the menopause); that in other cases abuse of the sexual functions may exert a prejudicial influence, and that this is illustrated by the occasional occurrence of isolated cases presenting a similar central amblyopia, in which no cause but the sexual excess can be found to explain the atrophic change in the optic discs.”

Whilst it is true that a comparative study of the ages at

which the disease first manifested itself did show that a large number of those affected by the disease were either at or about the age of puberty, or at the age (in women) when the sexual functions cease (the menopause); nevertheless, the absence of any symptoms which indicated derangement of these functions in but a small number of the cases, and the occurrence of the disease at an age remote from these periods in so many instances, would lead one to think that the author had rather exaggerated the importance of the reproductive system as an exciting factor in the development of the disease. The possibility, however, of the sexual system exerting an influence in the reproduction of optic nerve atrophy should not be lost sight of, and while I do not think it deserves the importance attached to it by Habershon, nevertheless it may, in a number of instances, like tobacco and alcohol, be the cause which operates on nerves already predisposed to inflammation by other exciting factors, chief among which may be a peculiarity in the development of the sphenoid bone.

In an article entitled "Remarks on the Field of Vision in Certain Cases of Neglected Eyes," De Schweinitz has divided his cases into three groups, according to the character and extent of the lesion in the visual fields. In the third group he has embodied cases with or without concentric contraction of the color and form fields, but associated with (a) diminished central color perception, either at the point of fixation and surrounding it, or between it and the blind spot or (b) with scotoma chiefly for colors. In the four cases cited by him the defect in vision had existed since childhood, and there were visible changes in the discs. I have also studied several cases conforming to this type, and have noted a grayness of the nerves associated with the central scotoma. It suggests itself to me, therefore, that the lesion in the nerve in these cases also may be due to an anomaly in the sphenoid exerting a unilateral effect only, and operating at an unusually early period.

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- 2.—Habershon, Trans. Ophth. Soc. of the United Kingdom, Vol. VIII.
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- 4.—Norris, *Ibid*, p. 665.
- 5.—Leber, Arch. f. Ophth., 17—2, p. 249.
- 6.—Mooren, Ophth. Beob., 1874, p. 305.
7. Berger, Les Maladies des yeux dans leur Rapports, avec la Pathologie générale, pp. 162 and 264.

REMOVAL OF THE TARSUS AND RETROTARSAL FOLDS IN CERTAIN CASES OF CHRONIC TRACHOMA.

BY CASEY A. WOOD, M. D.,

CHICAGO.

ILLUSTRATED.

In the year 1882 Heisrath, at that time one of the assistants in the University Eye Clinic at Königsberg, desired to obtain some samples of trachomatous tarsi for purposes of histological examination. A strip of tarsal cartilage 4 mm. in width and 1.5 cm. long, including the overlying conjunctiva and connective tissue, was removed from the whole length of the convex border.

At least two very important results were derived from this tarsal excision. In the first place we obtained a description of the minute alterations commonly set up by the disease in the tarsus and a valuable surgical procedure in the treatment of the condition was discovered.

The excised specimen was given to Professor Jacobson, of the University, who published the result of his examination of it in his well known *Beitrag zur Pathologie des Auges*, Leipzig, 1888. Jacobson's report shows, as we now well know, that the disease called trachoma attacks not only the conjunctival and subconjunctival tissues but burrows deep into the substance of the tarsus, planting here and there numerous colonies whose activity may persist long after the conjunctival depots have atrophied or have been removed by operative interference. The lid thus operated upon by Heisrath healed very kindly and quickly and the effect upon the diseased eye was very marked. This latter fact led him to excise the tarsus and conjunctival folds in other patients similarly affected and he has given us an account of this method of treatment in 230 cases.

My own experience of the procedure is limited, by the fact that I have resorted to it only during the past few.

months, since hearing Kuhnt's enthusiastic reference to its value at the meeting in Moscow of the International Medical Congress. I have, however, operated upon fourteen cases and with the very best results. The instances in which I felt called upon to do this operation were, broadly speaking, those chronic cases where the lids show trachomatous infiltration, with granulation deposits in the connective tissue of the retrotarsal folds, whether the cornea be affected or not. If to these conditions be added thickening and enlargement of the tarsus itself, the operation is even more urgently indicated. Also when there is evident disease of the folds, without apparent thickening of the cartilage, but the cornea is implicated, the operation should be done. A very important class of cases, from an operative standpoint, is that where with atrophy or cure of previously existing granulations in the tarsal folds there remain deep seated foci in the tarsus. In this troublesome and inveterate form of trachoma, whether the cornea has escaped or not, removal of the tarsus will give gratifying results.

I would not advise the operation in the early stages of the disease, where the tarsus is unaffected and the cornea free of disease. I do not think it justifiable in those cicatricial forms of trachoma that have proceeded to shrinking of the tissues composing the conjunctival sac. In this latter instance there are rarely any active trachomatous nodules in the tarsal cartilage. Nor should it be resorted to if it be possible to remove one by one, the scattered deposits themselves (Gifford.)

The palpebral conjunctiva is rarely the only site of granular deposits in long standing cases of the disease. It is quite exceptional that the tarsus and submucous connective tissue escape. I believe that I am correct, therefore, in asserting that the simple method of excising the retrotarsal folds (long ago advocated by Richet and Galezowski) does not meet the requirements in such cases. The proposition is practically to remove the neoplasms that are responsible for the destructive lesions in the later stages of the disease. Why then, should we remove a portion of these semi-malignant tumors and allow the others to remain? As long as there is reasonable ground for

assuming that the activity of the trachoma colonies is confined to the conjunctiva and submucosa such procedures as *grattage*, the use of forceps, cauterization, excision of the diseased membrane, etc., are, of course, proper, and the method that I am about to describe is not intended for their relief.

Although it is desirable that the eye should be as quiet as possible before operation I have not hesitated to excise the tarsus either in the presence of corneal ulcer, increasing pannus or during an acute exacerbation of the chronic disease. I have been satisfied with the results in these instances but have been careful to remove the stitches at as early a date as possible and to keep up constant disinfection of the eye while they are *in situ*.

All the German authorities consider cocain a sufficient anesthetic. Kuhnt instills a 4 to 10 per cent. solution as a preliminary and then makes two or three subconjunctival injections of a 6 to 10 per cent. solution. I have not found this very satisfactory with my patients and I now invariably insist upon a general anesthetic. Not only is the operation a painful one (particularly when more than one lid is involved) but its success largely depends upon precision in placing the sutures and in other details difficult to carry out if the patient be restless or nervous.

The diagrams, from Kuhnt's work, illustrate the various steps of the operation, which I shall now proceed to describe.

When the operation is done, as it usually is, on the upper lid, the latter is everted so that the convex border of the tarsus is thoroughly exposed. This is now firmly grasped by two strong, toothed forceps at the junction of the middle with the outer and inner thirds of the tarsal margin, and drawn firmly upward by the assistant standing at the patient's head. The junction of the palpebral and ocular conjunctival is now fully exposed and may be readily examined. Following as nearly as possible the margin of the diseased area an incision is made from the outer to the inner canthus through the conjunctiva only. Unless, in consequence of previous mechanical treatment, the conjunctiva is bound down to the underlying tissues, the wound will gape and the fibres of Mueller's muscle

may be recognized. Three stitches should now be passed through the bulbar margin of the incision, care being taken to include only the conjunctiva and a few fibres of the submucosa. If more than a mm. in width of conjunc-



Fig. 20.
(Kuhnt).



Fig. 21.
(Kuhnt).

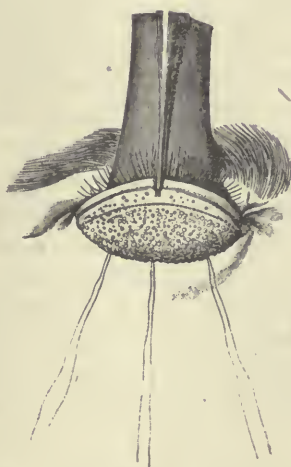


Fig. 22.
(Kuhnt).

tiva is included in the sutures small symblepharon folds may form opposite each stitch, and if too deeply inserted there will be a noticeable dragging on the lid edges, as occurred in one of my own early attempts.

A word as to the kind of suture. In my opinion the stitches should be of some soft, non-irritating material that can be readily seen even when it is imbedded in the conjunctiva. I have invariably employed black, braided silk, preferring size number 2. This should first be soaked in equal parts of phenol and glycerine and then placed in sterilized borax water until used. It is very important that no stiff, unyielding material should be employed for these stitches. Once introduced through the lower wound margin they should be allowed to hang down over the globe (see the diagram) and to rest on a sterilized towel placed on the cheek. After the sutures have been thus placed the bulbar conjunctiva should be separated from the globe a distance of 5 mm. from the edge of the wound. The forceps may now be removed from the convex border of the tarsus and the lid margin be grasped at its middle point, a horn spatula being passed behind the everted lid, as shown in the diagram. A second incision, running the whole length of and parallel to the lid edge, is now made as nearly as possible in the healthy conjunctiva. Sometimes this will be three, sometimes even five mm. from the palpebral border, the intention being to remove as little of the unaffected mucous membrane as possible and so to leave as large a portion of the central conjunctiva area as is consistent with the needs of the case. The spatula may now be removed, the assistant drawing the lid upward and backward with one or two fixation forceps. The operator then siezes the tissues at the nasal junction of the two incisions and with scalpel and scissors slowly excises conjunctiva and tarsus, carefully avoiding the orbicularis and Mueller's muscle. At this point the anesthetic may be removed and time allowed for the bleeding to cease. I have not been much troubled with hemorrhage, although some small branches of the arterial supply may have to be twisted.

The conjunctival sac should now be thoroughly irrigated and the lips of the wound brought together. To secure a satisfactory result one must be particular to place each suture in both wound margins so that it will exactly oppose its fellow when the eye is closed. It is also requisite that the bulbar conjunctiva should not be too much

put upon the stretch. The middle suture should first of all be tied with a single knot and it is wise to make certain, by closing the lid, to ascertain whether the precaution just mentioned has been taken before the final knot is tied. I would advise the operator to allow the patient to recover from the anesthetic sufficiently to enable him to determine accurately whether the palpebral movements are sufficient and to be sure that there is no irregularity visible at the lid margins. If the interpalpebral space is the same, both with the eye open and shut as it is on the opposite side, and if the lid margins have a regular outline, all is well and the threads may be cut off close to the knots.

As a rule there is little subsequent pain, and very little reaction.

The *after treatment* is simple and need not interfere with the attention properly demanded by the presence of corneal ulcer or other complications. On the whole I find that gentle irrigation of the sac four or five times daily with warm boric acid solution, followed by the instillation of warmed and sterilized vaseline, is grateful to the patient and acts very nicely. The vaseline keeps the sutures soft and serves to protect the cornea. I apply a light bandage over both eyes and order the patient to keep quiet, but do not insist upon his remaining in bed. The sutures are removed on the fourth or fifth day. In a week or ten days the wound is usually quite healed but the sac should be examined for the presence of granulation tissue or irregular wound margins. These are best clipped off or trimmed with scissors.

It is advised by some operators that no stitches be used, owing to the possibility of corneal lesions. For my own part I have not witnessed these untoward results when the precautions I have mentioned have been taken, and I am sure that healing occurs sooner and the cosmetic effect is better when sutures are employed.

The dimensions of the excised tarsus may properly be considerable—even $2\frac{1}{2}$ cm. long by $1\frac{1}{2}$ cm. wide. Of course one must not forget that in many instances the tarsal thickening and infiltration are the result of the disease and the size of the portion removed may be largely determined by these facts.

The objections that I have heard put forth to the combined method are: (1) that the simple operation, as well as the removal by other means of the diseased nodules, answers all the ends required, and, (2) that the tarsal excision very often makes a bad matter worse. I have only time and space to enter a general denial of these allegations and to affirm my belief that when undertaken in the manner and under the conditions just described, the tissue destruction brought about by chronic trachoma is greatly lessened, the time required for a cure is much shorter and the corneal complications are soonest cured or most certainly prevented by this combined operation.

It is, perhaps, not definitely decided what part a shrinking, atrophied tarsus plays in entropion and other anomalies of the lids, but whatever disadvantages it entails, is removed by excision. In one of my cases where epilation had been practiced for months to relieve a troublesome trichiasis the cilia have ceased to give any further trouble, a marked pannus has disappeared and the vision has improved from less than 1/10 to 2/7. Lately Kuhnt has advised removal of the tarsus alone, *i. e.*, without excision of the folds. In those cases, that I rarely see, where the trachomatous nodules are confined to the tarsus, I should think this operation preferable, for obvious reasons, to the combined operation, but I have had no experience of it.

A CASE OF "MATHEMATICALLY-PERFECT EYES."*

BY GEORGE M. GOULD, M. D.,

PHILADELPHIA.

On October 12, 1897, I was consulted by a gentleman 50 years of age, whose chief complaint was of subconjunctival hemorrhage, which had occurred on an average every two weeks during the past year. I found out that he had consulted a great many oculists during this time, who had either given general treatment for gout (of which there was some slight evidence), or had sent him to the general practitioner, or had only prescribed reading glasses, etc. The hemorrhages seemed to come on spontaneously, and were bothersome chiefly because they gave the man such a frightful appearance, and caused mental worry, rather than any decided pain or trouble of vision. One eye was generally affected at a time, and as the hemorrhage only stopped when the subconjunctival space was thoroughly filled with blood, the appearance of the eye and patient is easily imagined by any one. I frankly asked the gentleman what he supposed I could do for him, when the large number of the best men in the city had failed. His own faith was plainly little, but I was compelled to try. General disease of any pronounced type was excluded by thorough examination; the family history and personal history were beyond reproach, and one of our most careful "internists" had treated him on general principles for this one ocular symptom without influencing it in the least. The muscular coordinations of the eyes were as perfect as they could be, and by all non-mydriatic tests both eyes were absolutely emmetropic; the visual acuity was 20/20+. Indeed, the man had soon told me that he was an optical curiosity, other oculists having marveled at the emmetropism of his eyes, and one especially—a man of

*Read before the Section of Ophthalmology of the American Medical Association, at its meeting in Denver, June 7-10, 1898.

large practice and scientific ability—had repeatedly said that his was the only pair of "mathematically perfect eyes" he had ever seen. It was certainly a gloomy outlook for the man with a fad—the "oculist hobby rider."

Relying, however, upon the results of many experiences I proceeded to work upon the basis of what have become axioms with me, viz.: *No mydriasis, no diagnosis of refraction, and All presbyopia is only relative.* Under a mydriatic I found the visual acuity as perfect as it had been without it. Then I comforted myself with another maxim: *Perfect visual acuity is no proof of the non-existence of an error of refraction,* and I was soon able to demonstrate an error as follows:

R.—Cyl. 0.25 D. ax. 90° .

L.—Cyl. 0.25 D. ax. 180° .

Now, I did not say to myself that this tiny error of refraction was the cause of the conjunctival hemorrhage; I did not then dream that it was, and told the patient that if any local cause for this existed I believed it was due to the failure to use presbyopic glasses while eating meals, card-playing, etc. With this end in view I ordered bifocal spectacles, for distance the cylinders as above, and for near a proper spherical added. Then came downright rebellion; the man was mad at the idea of wearing the "hideous things." I said, then, that this was my prescription and, unless followed, I stood discharged. He went away savage and disgusted, but did order the bifocals, wore them one day and, more wrathful than ever, ordered the optician to turn them into two separate pairs of eye-glasses. As I had washed my hands of the case, I allowed the optician to do as the man desired, and not seeing him again I supposed he had left me for another and a less dogmatic adviser. I had quite forgotten about the matter when, in two months, my office-boy brought up a bill my secretary had sent the man, and a check to pay it, saying the gentleman had asked to have the receipt signed, would not come up, etc. Luckily, I remembered the name and returned the receipt by my own hand, impelled by a certain quizzical curiosity. He was evidently in a very different mood, said he did not want to trouble me, intended writing, etc., but was glad now to

tell me how happy he was with his eye-glasses. I have seen him several times since, and to shorten an overlong story, I will say that not only has there been no recurrence of the hemorrhages, except one very small one, since getting the glasses, but a previous discomfort uncomplained of, and hardly recognized, is completely relieved, but returns at once if the low cylinders are not worn; this discomfort is now so decided that he has had made heavy steel spectacles to wear in his bath, the sense of pressure and irritation being so great even in a time so short as that.

I shall not attempt to explain the *modus operandi* of a low astigmatism producing so severe and unwonted a result as these hemorrhages. That it did produce them I have not the shadow of a doubt, and the method is perhaps readily enough divined by all of you. There is only a single negative I wish to emphasize, and this is the reason I have gone into the rather gossipy details of this case: there is not the least crevice wherethrough may creep the suspicion of hypnotism or autosuggestion. The man was mad at me and I was provoked at him; he refused to follow orders; had no faith in the diagnosis or the doctor; and as a last climax clap I was utterly mistaken in my diagnosis! It was not the need of bifocals, or of presbyopic correction that was the true etiologic factor, but simply the low myopic reversed astigmatism. The fact of this only came out through unfaith and indirection, by wearing the forbidden eye-glasses.

This has led me to entitle this report a case, *i. e.*, a disease, of emmetropically perfect eyes, and so many lessons are suggested by it, lessons which I myself have long needed, and which, perhaps, one or two of you may profit by, that I have been moved to report the case chiefly for the fun of the *haec fabula docets*. These shall be most briefly recapitulated.

1. The most important lesson that springs into view, one which every day, and in every journal, and in every other case-report, should be printed in double caps, is this: Although a patient has been examined by one or more good oculists, and glasses prescribed, or reported as not needed, the fact has no significance whatever. It does

not prove that eye-strain does not exist, nor that it is not a source of any of the results that eye-strain may produce. This seems extreme and even revolutionistic, but it is literally true. In this case the proof of the pudding is not in the eating. There are a hundred qualifications needed to the bald statement that "glasses did not lessen the symptoms," or "the oculist reported the eye-examination was negative," or "eye-strain was ruled out by careful tests," etc., etc. I don't care a button for such an assertion; it is simply meaningless unless very many other considerations go with it. Do not for an instant think I make an exception of myself, or wish to cast any slur upon the work of others; that would be simply silly. What I mean, of course, is that in these infinitely delicate matters, in these calculations of infinitesimals, slight differences, inobviable personal equations, etc., may indeed occur, and be the reason of failure. but beyond all this there are numberless questions, *e. g.*, as to correctness of make and accuracy of adjustment of the glasses; as to methods of wear or non-use; as to habits and peculiarities of eye-work; as to length of disease; as to suddenness of consequent refraction-changes; as to the frequent impossibility of curing a result by curing its cause; as to complicating causes; as to intercurrent general diseases, etc., etc. Not only in the case reported, but in hundreds more I have learned that my own errors, mistakes and blunders, as well as those of others, may show the fallacy of a single judgment; a multitude of provisos must be excluded and the subsequent history closely scanned in order to prove or to disprove the lumpish dictum, "glasses gave no relief." Facts are stupid and useless things without an intellect to discriminate, marshal, and use them. It takes more than a lot of rocks to make a lock or a breakwater.

2. A very slight or uncorrected error of refraction may be the cause of strange and serious reflexes and results, and this is especially true if it be unsymmetrical astigmatism, and still more surely if it is a low degree myopic astigmatism, in which there is no means of escape by blunting into amblyopia, or by shunting into heterophoria, and no possibility of a ciliary-muscle contraction overcoming the defect.

3. Low-grade myopic astigmatisms, are hard to diagnose, and are in practice too commonly overlooked and neglected, although they must be as common relatively as hyperopic varieties.

4. It is only by the mydriatic, combined with infinite patience, delicacy, and skill, that such astigmatisms are correctly diagnosed. Perfect visual acuity is no disproof of coexisting ametropia.

5. The mydriatic is more necessary in presbyopia than previously. All the text-books and teaching are wrong in this. Precisely when the compensatory mechanism is being narrowed by presbyopia, is then the greatest need of accuracy in the correction of the smallest degrees of anisometropia and astigmatism. Then, also, the vital powers are failing and the cataract-age is nearing, so that precision in refraction is doubly and trebly imperative. Presbyopia is always relative, never absolute, particularly if proper glasses have not been worn during many previous years. Without a mydriatic there is no adequate estimate of errors of refraction, and between the ages of 40 and 55 the estimate should be painstaking to the uttermost degree, especially if any suspicious reflexes exist.

6. Absolute emmetropia, “a mathematically perfect pair of eyes” does not, I believe, exist. A perfect leaf has not been found, nor absolute symmetry in any organic thing. The report of perfect emmetropia is a confession of negligence and unskilfulness. I have made such reports myself and can, therefore, speak dogmatically. If such a diagnosis has been made without a mydriatic the negligence deserves a much harsher naming.

7. And even if there were such a mathematically perfect pair of eyes, I can easily imagine circumstances in which such eyes might be the cause of morbid results. As orthophoria is always a disease, so emmetropia, in a seamstress or in almost any hard-pushed eye-worker; in a neurasthenic, in a heterophoric, or in a presbyope, may functionally be a disease and require correction by glasses. Emmetropia is nature’s unrealized ideal for the animal, savage, and primitive man. A low-degree simple myopia,

alike in both eyes, is the desideratum of the slave of civilization.

To focus this long-winded reading into a sentence I should say that when a possible or suspicious ocular reflex exists, painstaking mydriatic refraction and correction are necessary both in presbyopia and in "a mathematically perfect pair of eyes." And when this has been admitted comes the rider that even after all has been done it cannot, with utter certainty, be said that the eye-strain was not, or is not, the ultimate source of the morbid symptom.

HISTOLOGICAL METHODS IN OPHTHALMOLOGY.

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The following methods of preparing specimens for microscopic examination, and of preserving and staining specimens, are those commonly used. There are, of course, very many methods, but the following answer best for the routine work:

For preserving pathological material in eye work, Zenker's and 10 per cent. formalin are used. Zenker's penetrates quickly and fixes the nuclei, etc., and renders staining of the parts accurate. It leaves a precipitate of mercury in the sections, which is best removed in the section during the process of staining. In using it:

1. Place in Zenker's solution 12-24 hours.
2. Place in a jar under a very slowly turned faucet, with a very small hose connection running to the jar; 12-24 hours.
3. Place in 75 to 80 per cent. alcohol, and it is now ready for the further steps.

In mounting, celloidin is preferred and is used in two solutions, thin and thick.

I quote the formula for making celloidin from Wright and Mallory:

To make thick celloidin: 30 grams of dry celloidin dissolved in 500 cc. of a mixture of equal parts of ether and absolute or 95 per cent. alcohol; this gives a 6 per cent. solution. Diluted with an equal amount of the ether and alcohol mixture, it forms thin celloidin. The smaller the pieces imbedded, the better the sections.

4. 95 per cent. alcohol, 24 hours.
5. Ether and 95 per cent. alcohol, equal parts 24 hours.
6. Thin celloidin 1-7 days.
7. Thick celloidin, 1-7 days.

8. Place on the vulcanized fibre block, allowing it to remain in the air a few moments to harden.

9. Place in 75 to 80 per cent. alcohol, 6-24 hours.

Before making the sections with the microtome, trim the section at the edges and down to the specimen from above to save dulling the microtome knife.

Sections hardened in 10 per cent. formalin go through the same steps as above, beginning at No. 3.

When a whole eye section is desired, the globe, immediately upon removal, must be placed in 10 per cent. formalin for about one week, or better longer; then it is frozen. This is done by wrapping the globe in rubber and tying it tightly; then it is placed in a pot perforated at the bottom and packed in salt and ice; it usually freezes in about two hours' time. After removal, it is sawed in halves with a sharp case knife, cutting through the center of the cornea and the optic nerve, handling very carefully.

After this it is put back in formalin till thawed out; then in 75 per cent. alcohol, or begin at the third step above and go through the same process.

In cutting sections with a celloidin microtome, the section should be so placed as to have the greater part of the blade sweep the section each time; the knife must have a smooth, sharp edge, and the specimen must be kept moistened in 75 per cent. alcohol, allowing it to constantly drip on the specimen from a drop bottle. The smaller the section, the thinner it can be made; usually to obtain a whole eye section, it is necessary to be a little thicker, but always make them as thin as possible.

Stains: The common method of staining is the alum hematoxylin and eosin method, the first being the nuclear, the last the general stain.

1. Method of staining sections hardened in Zenker's to rid the mercury from the section the iodine grm. 1, pot. iod. grsm. 2, water 300 ccm. solution is used. Alum hematoxylin should always be filtered before using.

Eosin is used in one-half per cent. aqueous solution. The steps are:

1. 80 per cent. alcohol.
2. Water.
3. I. K. I. sol. above, 1 min.

4. 95 per cent. alcohol, till the iodine is dissolved from the section.

5. Water.

6. Alum hematoxylin 2-3 to 15 minutes, judged by placing the section in water; it should have a delicate blue color.

7. Wash thoroughly in water.

8. Solution eosin 5-16 sec.; when in doubt as to the amount of stain in the section, place on a slide and examine with the low power of the microscope.

9. Water.

10. Alcohol 95 per cent.; the alcohol removes any slight excess of eosin.

11. Oil of bergamot to clear.

12. Place on the slide.

13. Canada balsam.

Sections hardened in formalin are stained by the above method, beginning at step 5.

Sections stained too deeply by the hematoxylin may be decolorized by Orth's discharging fluid; but after using it, the section must be washed thoroughly and quickly in water.

Sections must be thoroughly dried on filter paper before going into the clearing alcohol; likewise, no alcohol must be on the section when it goes into the oil of bergamot.

Large sections are best handled on cigarette paper—all must be kept perfectly flat.

In placing it upon the slide, dry it and press gently with a piece of unglazed paper before putting on the balsam; for whole eye sections, the larger slides and cover glasses are necessary.

For preserving the natural colors of a specimen, Kaiserling's solution is used. Specimens must be hardened and kept in the dark. Its results are very fine.

Eye-cups: Of the various eye-cups used by the different eye pathologists for preserving globes, mention is made of only one, the formalin cup; its advantages are its simplicity, not requiring much skill in its accomplishment; it is not affected by heat, and should any microscopic sections be desired from the eye, they can be had. They consist of a clear, thick glass, flat bottomed bottle, with a

large nozzle; into this is fitted a large rubber stopper, with a perforation in the center, through which passes a short glass rod; the rod is for the purpose of keeping the eye in place. When the eye is examined one looks through the bottom of the cup.

Preparation of the eye: After it is thoroughly hardened in 10 per cent. formalin, (that is 10 parts of the aqueous, 40 per cent. solution of formaldehyde and 90 parts water) the globe is frozen and cut in halves, as described before. The chief difficulty in mounting is the air bubbles; to overcome this, the water in making the formalin is first boiled in a large test tube over a Bunsen burner, then allowed to cool; then the formaldehyde is added gently. After placing the eye-half in the cup, it is filled with formaline solution; the stopper is slid over the side of the bottle to avoid air bubbles. Then after filling the perforation in the stopper to the top with formalin, the rod is also slid in from the side and pressed down until it fixes the globe in the center of the cup.

In closing, a few words regarding the staining of bacteria in tissues. The few important bacteria to be stained in sections in ophthalmology, stain by the Gram-Weigert method. This consists of:

1. Stain in carmine 5-15 minutes, (carmine 2 grams, alum 5 grams, water 100 ccm.); boil twenty minutes; adding enough water to make up for that lost by evaporation; cool, filter, and add a crystal of thymol to prevent mold growth.

2. 95 per cent. alcohol to dehydrate.

3. Place on the slide, keeping it constantly moistened with 95 per cent. alcohol; holding the slide with a side-to-side twisting motion, allowing it to be constantly bathed with ether vapor. When the celloidin is dissolved, plunge the whole slide into 80 per cent. of alcohol to reharden it to the slide.

4. Stain in Ehrlich's aniline gentian violet 5-20 minutes.

5. Wash the section thoroughly in normal salt solution.

6. Place in Weigert's modification of Gram's iodine solution; iodine 1 m., pot. iod. 2 ms., water 100 ccm. for one minute.

7. Wash thoroughly; better under faucet.

8. Dry section with filter paper.

9. Aniline oil; this removes any excess of color and dehydrates. Several changes, allowing it to run back and forth on the slide until the section is thoroughly cleared.

10. Xylol; three changes.

11. Mount in xylol balsam.

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A METHOD OF DETERMINING LATENT HETEROPHORIA.

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ILLUSTRATED.

The method here described for discovering latent heterophoria, I have used now for more than three-years, and feel justified, after so extended a trial, in publishing it, believing it to be the most reliable and accurate method yet devised for determining the existence and amount of error, showing as it does nearly, if not quite, the total latent error present. Briefly, the method consists of excluding from vision each eye alternately for about twelve hours, and then noting the position of the visual axes.

The method pursued is as follows: One eye is covered



Fig. 1.

with a patch or blinder, and the form and make-up of this patch are of considerable importance. It must not press upon the eye, nor in any way impede its movements. The form which I have come to prefer is cut from medium weight cardboard and covered with black cloth. Its shape when cut from the card is shown in Fig. 1. The greatest length is between five and six inches, and its width between three and four inches, depending upon the contour of the patient's face, etc. At *a* the card has a slit

cut down from its upper edge extending half way across it. The cut edges are overlapped about one-half inch, as shown by dotted lines in the figure, and cemented with glue. The patch is thus made convex on one side. At the four points marked X, narrow tapes are fastened, which are long enough to pass around the head and be tied behind. It is better to cover the board with cloth first and cut the patch afterward. It should be trimmed to fit the nose closely, so that the covered eye cannot share in the vision of its fellow. It should extend well up on the forehead, so that the upward rotation of the eye is in no wise impeded.

Such a patch is placed over the eye at night upon retiring, and worn *continuously* until the examination is made the next morning. When examined, the eyes should be closed while the patch is removed and the trial frame with Maddox rod is adjusted. The light should be on a horizontal line with the eyes and care should be taken that the head be held in a normal, upright position. The usual precaution to neutralize any gross refractive error is, of course, to be observed. The direction of the visual axes is then noted and also whether their relative position varies as the position of the head is changed; *e. g.* whether the horizontal streak changes its position when the head is thrown far back, and when bent low, forward; as this may give a hint as to whether we have a hyperphoria or a hypophoria. The other eye is then treated in the same way.

The results show at once whether heterophoria exists, and they also show whether there exists a tendency of both visual lines upward or downward. For after excluding the right eye, a right hyperphoria of 3° may appear and after excluding the left eye, an equal left hyperphoria, showing a tendency of each eye toward upward rotation. As is apparent, all combinations may be shown.

GLAUCOMA WITH DETACHMENT OF RETINA.

BY WILLIAM CHEATHAM, M. D.,

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This complication is so rare that I thought these two cases of enough interest to present to this society. I hope it will bring out discussion, especially as to the advisability of an iridectomy in the first case.

First patient, David C., aged 16 years. Came to me October 18, 1894, with the following history: Dim vision in right eye; some pain. Had this trouble for three years. Came on suddenly with pain. V. R. = perception of light; V. L. $\frac{20}{20}$ Em. Tension R. E. + 1. Pupil dilated; responds to accommodation, but not to light. Arterial pulsation well marked and very rapid. Heart beat about 120. Nerve outlines indistinct. Eserin and pilocarpin solution to be dropped into eye every three hours. December 23, 1894, tension + 1. Mydriasis and pain, unless he uses the drops. Arterial pulsation; pulse 120; whole of retina detached except possibly at macula. Periphery of optic nerve myopic; optic nerve cupped. V. R. = perception of light. January 28, 1895, V. R. = $\frac{6}{200}$. Other symptoms about the same, except V. R. = perception of light. March 9, 1898, symptoms about the same. So far as I can judge the detachment has not increased. No indication of an intraocular tumor, except the detached retina with the increase of tension. Between January 28, 1895, and March 9, 1898, I saw him many times, but could discover no change in the local condition.

The points of interest in this case are first, the combination of the two diseases, and the age of the patient; also the glaucoma preceding the detachment.

From the history of the case it is to be supposed that his glaucoma set in at the early age of thirteen years.

Z. O. G., came to me September 24, 1891. Had noticed vision of right eye failing for some three or four months. V. R. = $\frac{20}{200}$; eccentric = $\frac{20}{40}$, c. - 2.50 D. \ominus - 1. D. axis 180° . Small central scotoma. V. L. = $\frac{20}{20}$. No improvement with glasses; both optic nerves cupped: right worse than left; floating bodies in vitreous; no pain. Chronic glaucoma both; gave drops of eserin and pilocarpin. November 7, 1891, detachment of retina right; cornea cloudy. November 29, 1891, V. L. = $\frac{20}{20}$ c - 50 D. S.

I think the after history of this case is a gradual progression of the detachment of the retina, with secondary

cataract. One especial peculiarity in this case was the perfect visual field, excepting a small central scotoma.

We are all well acquainted with the theory of Leber and Nordenson as to the cause of detached retina. It will not account for all such cases, especially those acute ones resulting from trauma. In such cases the changes spoken of as occurring in the vitreous, cannot possibly happen. Detachment of the retina can occur and the fulfilment of the Leber and Nordenson theory result without *visible* opacities of the vitreous. We all know that the tension may be either normal, minus or plus, with detached retina; that when it is plus, an intraocular tumor should be suspected. We know that iridectomy has been advised in the treatment of detached retina. Galezowski and Dausart have advised and performed iridectomy in such cases, especially where both eyes were involved. Dausart operated forty times with eighteen incomplete recoveries, the improved vision lasting from two weeks to one year. In the first case, as reported* by me tonight, I would like very much to hear the Fellows express an opinion as to whether or not we could expect any good from an iridectomy, as the case is complicated with an inflammatory glaucoma; he complains much of pain in his blind eye, which is relieved by eserin and pilocarpin used locally.

I add pilocarpin to the eserin first because it prevents the drying effect of the eserin on the cornea and conjunctiva, and I believe by use of the combination we are less liable to have iritis follow. I frequently use the alkaloids of the two salts in sterilized olive oil or oil of sweet almond for the same purpose.

*The Louisville Ophthalmological and Laryngological Society.

A REPORT OF SOME CASES TREATED BY ELECTRICITY.

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A fair amount of reading of ophthalmological journals and text-books on diseases of the eye, as well as conversations with my confreres, give me a decided conviction that electricity is not used in the treatment of eye diseases as much as it should be.

It is not claimed that it is a panacea, but in my experience it has produced more decided benefit in a very unfavorable class of cases than any other remedy tried, such, for example, as potassium iodide, mercury and strychnia, which are classical and uniformly advised by the text-books for about all the diseases the fundus of the eye is heir to, or can possibly acquire. It is difficult to understand the slight favor or positive incredulity in which the use of electricity is held. The former remedies, for instance, are freely recommended in opacities of the vitreous and optic nerve atrophy, while the suggestion of the use of galvanism in optic atrophy is objected to on the ground of an unalterable condition of the nerve. If atrophy can be produced by non-use of an organ, by interference with its vascular supply or proper nutrition, or by compression, it is at least reasonable to expect that an agent such as electricity, which can stimulate the circulation and discuss the hyperplastic interstitial tissue of the nerve, and thus prevent secondary contraction and atrophy, may arrest its degeneration or restore function and favorably modify nutrition. But our province is not to attempt an explanation of the action of the remedy, but rather to give clinical examples of its usefulness.

We cite briefly some of the text-books as to the recommendation of electricity in optic nerve atrophy and opacities of the vitreous.

In the former Noyes says it has no real value, but by exciting phosphenes it fosters the hopes of a credulous incurable.

De Schweinitz remarks that competent observers have reported good results from its use.

Berry does not recommend any treatment.

It is employed with but slight success (Fuchs).

The constant current is said to have stopped and improved the disease, but treatment was unsuccessful and progress hopeless (Fick). He does not mention the use of electricity in opacity of the vitreous.

It is warmly recommended by some surgeons in vitreous opacities (De Schweinitz).

The electric current has not been much employed, and is utterly without effect (Berry).

Gunn—Royal Ophth. Hospital Reports, June, 1881—gives the result of the treatment of optic atrophy and retinitis pigmentosa by galvanism.

We regret, for the value of the evidence, that the use of electricity was also combined with strychnia and potassium iodide, though we quite agree that "K. I. is utterly useless in such cases." My experience also agrees with his statement that strychnia injections are most unsatisfactory in a series of cases in which it was tried. Of his 18 cases of optic atrophy treated by galvanism, 6 distinctly improved, 4 received doubtful benefit, 8 were not improved or grew worse.

Gunn has reported remarkably good results of the treatment of old opacities of the vitreous by faradism and K. I. Four cases of retinitis pigmentosa were greatly benefited by the use of galvanism.

Miles Standish has also reported great benefit from the use of galvanism in retinitis pigmentosa.

I have used electricity in many cases for so short a time that no mention is here made of them. Some cases only, in which the treatment was sufficiently extended, are here reported.

As to the apparatus, both the bichromate of potash battery, and more recently the Edison current, have been used. The anode was applied to the nape of the neck, and the cathode to the closed lids for 5 to 10 minutes daily, with a current of 3 to 5 ma.

CASE I.—Optic atrophy following injury. Vision improved from ability to count fingers at 12 feet, to 6/18.

Mr. B., aet 61 years, was struck by a piece of scantling, 45 pounds in weight, on the forehead in August, 1896, rendering him unconscious for ten minutes. He resumed work in a week, but felt a sense of intoxication in his head. Two weeks later he fell from a wagon and struck the back of his head, but was not rendered unconscious.

He has had 13 children, 10 of whom are living. His wife had one miscarriage from overlifting. He has no history of syphilis or other disease; has had no cerebral or spinal symptoms; has smoked three pipes a day since 18 years old; takes one glass of liquor a day.

The field of vision, taken four months after treatment began, showed concentric contraction for each eye of 10° in the whole field.

Color Vision.—The right eye confuses purple with gray and gray with blue. The left eye confuses purple and green and gray with blue.

Before treatment:

Vision—R. E. = fingers at 12 feet slowly.

L. E. “ “ “

Fundi showed advanced atrophy of the temporal side of both discs. The choroidal pigment was thinned on the temporal side of each disc. The retinal vessels appeared normal.

Previous Treatment.—Was treated for three months at the Illinois Eye and Ear Infirmary by strychnia injections and internal medication, but vision continued to fail. The diagnosis, as told the patient, was optic atrophy. Prognosis unfavorable. For a month previously was treated at Hahnemann Hospital. Diagnosis and prognosis the same.

Treatment.—Apply galvanism daily for five minutes, the cathode to the closed lids of each eye and the anode to the nape of the neck, with a current of 5 m. a.

Four months later vision = $\frac{6}{18}$ with each eye. With + 4.50s before each eye V. = 0.5 (S) at 14"

Fundi: The discs show much more color than on the first examination.

Note: The patient has not applied for or recovered damages on account of the injury at any time after the begin-

ning of treatment. We state this so as to exclude the physiological effect of improved finances upon the vision.

CASE II.—Decolored disc. Vision increased from $\frac{20}{40}$ to $\frac{20}{10}$.

Mrs. E. D. C., aet 47 years.

The left eye has been blurred for a week. In reading she frequently misses words and the type is indistinct.

R. E. vision with glass = $\frac{20}{20}$.

L. E. “ — 13.00 sph. = $\frac{20}{20}$,
and a few words of No. 6 J.

L. E. Temporal side of disc is decolored.

R_y.—Galvanism.

After the ninth treatment, the L. E. has vision $\frac{20}{40}$ — with — 13.00.

The disc is more normal in appearance. Can read a long time with comfort.

CASE III.—Atrophy of the disc following sunstroke. Vision improved from reading 16 J. to No. 1 J.

Clara S., aet 11. May 24, 1883. While berrying in June last, on a very hot day, she noticed blurring of her sight, and upon shutting the right eye found the left could not see anything except the light. This continued until cold weather, when vision improved until spring, and since then has remained the same as at present. She felt ill with headache three days after the berrying, and probably had a sunstroke.

L. E. can read letters of 16 J. slowly, by holding the type to the temporal side. The left disc is very white in the outer three-fourths.

Diagnosis: Atrophy of the disc. R. E. V. = 1 J.

R Strychniæ sulph. gr. $\frac{1}{32}$ t. i. d.

June 29, 1883, V. L. E. = 14 J. Disc remains the same.

R_y Galvanism daily to the eyes.

July 11, 1883, eight applications of electricity have been applied. L. E. V. 1 J. at 3 inches, with central fixation.

August 1, 1883, L. E. V. 1 J. at 6 inches slowly; 2 J. at 6 inches fluently. Disc is slightly pale, but has much more of a pink color than upon first examination, Patient dismissed.

September 4, 1883. Writes: “I can see quite an improvement in my eye.”

CASE IV.—Sight failing for seven years. Vitreous opac-

ities; choroiditis. V. R. E. = light perception; V. L. E. = fingers at 5 feet. After treatment: Right V. = fingers at 6"; Left V. = fingers at 10 feet.

J. L., aet 26 years. September 5, 1897. Sight failing for the past seven years, and he can barely see to go about the farm. History and examination fail to determine the cause of the condition.

R. E. V. = Light perception only.

L. E. V. = Fingers at 5 feet.

Pupillary reaction sluggish. The *right eye* cannot be illuminated on account of opacities in the vitreous, which give a brown reflex. The *left disk* is blurred on the nasal side and decolored on the temporal side; numerous floating bodies in the vitreous; patches of pigment and choroiditis extend from the disc to the macula.

R Galvanism.

September 13, 1897:—O. D. V. = fingers at 6 inches.

O. S. V. = " 10 feet.

R. E. Pupil semi-dilated, and the center one-third obstructed by a pigment opacity. The outer inner thirds now later show a red reflex.

Patient went to West Side Hospital, and was given mixed treatment and returned home.

November 30, 1897—R. E. V. = fingers at 1 foot.

L. E. V. = " 8 feet.

Fundi the same.

CASE V.—Atrophy of optic nerves. Right V. increased from 10/200 to 16/200; left from 6/200 to 10/200.

J. C., aet 53 years. May 3, 1883. Sight has been failing during the past eight months. R. E. V. = $\frac{10}{200}$, L. E. V. = $\frac{6}{200}$. He has smoked three pipefuls a day for the past 20 years, until 6 weeks ago, when he discontinued; has had headache once a week for the past year; health is good; no cerebral or spinal symptoms; no syphilitic history.

Fundi: Each papilla is of a leaden white color; the retinal vessels are normal; marked atrophy of left disc.

R Galvanism daily. Injection of strychnine daily, increased to gr. $\frac{1}{16}$.

May 10, 1883: Vision—R. E. $\frac{16}{200}$; L. E. $\frac{10}{200}$.

CASE VI.—Dust opacities in the vitreous. Right V. increased from 18/30 to 18/20; left from 18/70 to 18/40.

H. S. L., aet 58 years. Jan. 25, 1886. Four weeks ago noticed a fog before the eyes, which has increased for the past two or three days; no history of syphilis or other disease.

Vision—R. E. = $\frac{18}{30}$ = 2 J. at 12 inches.

L. E. = $\frac{18}{70}$ = 14 J. at 12 inches.

Dust opacities in each vitreous; discs decolorated.

R_y Galvanism.

Feb. 19, 1886: Vision—R. E. = $\frac{18}{20}$, after electricity $\frac{18}{20}$.

L. E. = $\frac{18}{40}$, “ “ $\frac{18}{40}$.

CASE VII.—Floating bodies in the vitreous; disseminated atrophic choroiditis. Right V. improved from 6/15 to 6/9; left not improved.

Mrs. P., aet 49. Left eye. Sight has always been poor. During the past two years type has seemed blurred.

Fundi: Right eye appears normal; left eye, floating opacities in the vitreous; extensive disseminated atrophic choroiditis.

R. E. V. = $\frac{6}{15}$ — with glass.

L. E. V. = $\frac{6}{15}$ — with glass.

R_y Galvanism daily.

March 9, 1898: Has been treated at long intervals, R. E. V. = $\frac{6}{9}$; L. E. = $\frac{6}{15}$.

Patient says that before treatment she could not distinguish people across the street. She can now do so without glasses, and she is confident she sees much better.

CASE VIII.—Atrophy of optic papillæ. No improvement.

Dec. 28, 1891. J. P. W., aet 37 years. Three or four months ago noticed a cloudiness before the eyes when he came from a turkish bath. He has smoked 15 to 20 cigars a day up to a year ago, but has not smoked any for the past three months; contracted syphilis 16 years ago; had mixed treatment for two years. There is a question of tabes; referred to Dr. Sanger Brown, who did not find any organic disease.

Present condition,—Atrophy of both discs. R. E. V. = $\frac{6}{36}$ —; L. E. V. = $\frac{6}{36}$ —.

Field—R. E. to left 10°, to right 12°, down 37°, up 17°.

“ L. E. “ 25°, “ 42°, “ 25°, “ 15°.

Color vision. Confuses dark green with black, and purple with blue.

Pupils,—Myosis 2 mm. in diameter; they do not react to light and very slightly to convergence.

R. K. I. 10 grs. t. i. d.

December 31, 1891. Galvanism.

January 7, 1892. Strychnine up to $\frac{1}{8}$ gr. injected daily.

January 29, 1892. R. E. V. = $\frac{6}{36}$; L. E. V. = $\frac{6}{24}$.

Went to Hot Springs for treatment, where he remained for four weeks. He took K. I. 40 grs. t. i. d. and hot baths.

Upon returning, R. E. V. = $\frac{6}{36}$; L. E. V. = $\frac{6}{36}$.

CASE IX.—Right. No reflex from fundus. Left. *Vascularization of the vitreous*. Dust opacities in the vitreous. Retinal hemorrhages. V. improved from fingers at 7" to 6/22.

April 19, 1897. Mrs. M., aged 61 years; blindness began suddenly in the right eye eighteen months ago. The left eye has been failing in vision for the past two months. She notices specks floating before the left eye. General health good.

R. E. V. not equal to counting fingers. L. E. V. counts fingers at seven feet. The fundus of the right eye gives a grayish reflex.

Left. Numerous dust opacities in the vitreous; extensive vascularization of the vitreous. Large and small hemorrhages in the retina. Referred to Dr. Beard for a drawing of the fundus.

R. Hyd. submuriate gr. $\frac{1}{10}$ ever hour; galvanism daily to the left eye.

May 12, 1897, V. L. E. = $\frac{6}{22}$.

May 15, 1897, mixed treatment.

June 27, 1897. Her daughter writes, that her mother after returning home, could see to read the paper with the left eye. Two weeks ago vision failed, so that she is not able to see people across the street. Health good; no pain in the eye.

The last failure of vision was probably due to a fresh retinal hemorrhage.

CASE X.—Floating opacities in the vitreous. Right V. improved from 6/12 to 6/6; left improved from 6/50 to 6/15.

Mrs. H., aged 64 years. March 15, 1897. Sight of the

left eye has been failing for the past four years. Right eye has had photopsies since January and vision of late has failed very much. Health good.

R. E. Dust opacities in the vitreous. L. E. An iridectomy has been performed. There are large floating opacities in the vitreous. The background appears normal.

R. E. V. with glasses = $\frac{6}{12}$; L. E. V. not improved with glasses = $\frac{6}{50}$.

R Galvanism daily.

April 16, 1897; R. E. V. with glass = $\frac{6}{8}$; L. E. V. without glass = $\frac{6}{15}$.

Leaves for home to return in a month.

May 13, 1897. R. E. V. with glass = $\frac{6}{7}$; L. E. V. = $\frac{6}{15}$. Abundant dust opacities in the vitreous.

CASE XI.—Asthenopia relieved.

Mrs. H., aged 24 years. April 3, 1888. Two years ago the eyes pained her a great deal, and during the past six weeks they have pained and watered very much. She refuses to wear glasses.

R Galvanism daily.

Eleven treatments greatly relieved the pain in the eyes.

CASE XII.—Blepharospasm relieved.

B. H., aged 8 years. March 13, 1886. Nictitation of the lids for the past year, since he had an attack of measles. He has a good deal of pain in the eyes. Has always been delicate and nervous.

R Galvanism daily.

March 21, 1886. No pain or nictitation of the lids.

CASE XIII.—Asthenopia relieved.

Miss B., aged 21 years. October 17, 1897. School teacher. Her eyes have been very weak and painful since childhood, and she has been unable to see acutely. The pain has increased within the past six months. She has photopsies and blue and red flashes and she sees as if looking through a tube. The left eye never had good vision. General health poor; suffers from insomnia and dyspepsia.

Field: R. E. to right 55° ; to left 30° , up 35° , down 35° .

She is unable to read more than half an hour with glasses given her by Dr. Fowler, who referred her to me for treatment.

R. E. V. with — 0.50 cy. $180^{\circ} = \frac{6}{36}$; L. E. V. = fingers at 6 inches.

R Galvanism daily.

November 7, 1886. She eats and sleeps well; has no photopsies; can read as long as she wishes in the day time.

CASE XIV.—Asthenopia and headache relieved.

Miss G., aged 15 years. November 3, 1893. School girl. Is delicate and neurasthenic; subject to frontal headache for months past and the eyes and head pain, after reading an hour in the day time or a few minutes in the evening. After repeated testing under scopolamin and atropin;

O. D. accepted + 0.50 + 0.75 cy. 90° ; O. S. accepted + 100 + 0.75 cy. 90° ; ad. = 9° , ab. = 4° ; exophoria = 2° , accom. = 8 D; Stim. ad. (Gould) = 30° .

No insufficiency of oblique muscles shown by double prism and line test. Exophoria in accom. = 4° to 12° ; converg. = 10 m. a. (Landolt); V. D. = exophoria within 16".

Fields: Bilateral contraction (concentric) characteristic of neurasthenia.

Treatment: Phospho-albumin 5ii t. i. d.

The above compound lenses, and subsequently only the cylinders were given, the latter being preferred. Adducting and abducting prisms for exercising the muscles and also Gould's method of stimulus ad. prisms were prescribed, and later abducting prisms (5°) of rest for reading.

Repeated long vacations improved her health but did not relieve her head or eyes.

Many months of exercise with prisms did not increase muscular strength or relieve the symptoms. Prisms of rest and the glasses afforded relief of short duration only. As a last resort, treatment by galvanism was suggested by my assistant, Dr. Pattillo, and was begun September 21, 1896, and repeated daily.

October 30, 1896. The headache is much relieved; can read comfortably in the day time without glasses.

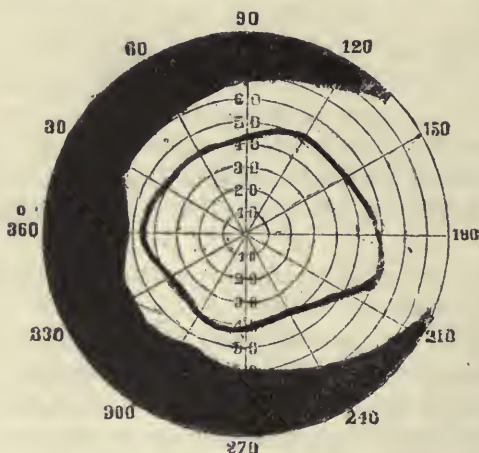
December 12, 1896. She has rarely had a headache during the past four months; can read any length of time

in the evening with perfect comfort for the past month.

January, 1898. Suffers very little inconvenience from eyes or head.

CASE XV.—Embolism or thrombosis of an infero-temporal retinal vessel of right eye of two months duration. V. increased from fingers at 14 feet to 6/15.

W. A. W., aged 57 years. April 1, 1898. Two months ago a shadow was noticed to be cast before objects, and upon testing, the defect was found in the right eye. The upper part of objects appeared shaded, while the sides and lower parts are seen better; objects look shortened



Right eye. Case 15, April 12th.

vertically (micropsia) and less so horizontally. There was at first moderate pain in the eye. Tension normal. There is a greyish opaque area of the retina in the infero-temporal quadrant. The fundus otherwise appears normal.

O. D. V. = fingers at 14 ft.

No history of syphilis or other disease.

Treatment: Galvanism daily.

April 11, 1898. O. D. = $\frac{6}{30} + 100 s = \frac{6}{15}$.

The vision has steadily improved since the first treatment.

April 13. Can distinguish the second-hand numerals on a watch.

USEFUL VISION RESTORED BY IRIDECTOMY IN A
CASE OF BLINDNESS FOLLOWING OPH-
THALMIA NEONATORUM.

BY GEORGE FRIEBIS, M. D.,

PHILADELPHIA, PA.

The patient's history, in brief, is that in the first week of infant life she had an attack of "sore eyes, resulting in perforation of both cornea," with prolapse of the lenses, producing anterior staphyloma.

When she was 2 years of age Dr. Cornelius R. Agnew, of New York, performed an iridectomy on the right eye, the outlines of which can still be seen, the patient now being in her 27th year.

Nine months ago she was referred to my care. Examination at that time revealed a visual acuity in right eye equal to the ability to see to count fingers at 1 m. distance, that of the left eye being one-third more; this being the state of her vision as long back as she could distinctly and intelligently remember. She stated, however, that latterly familiar objects appeared more "foggy" than formerly, causing her considerable anxiety of mind.

The great amount of cicatricial tissue formed in the process of repair, doubtless led to this still further gradual impairment complained of later in life, this probably being dependent upon imperfect osmosis and consequent malnutrition of the parts. Under atropin I attained but a pin-hole dilatation in the adherent iris.

The cornea of the left eye showed an encouraging transparency, both in the temporal and vertical meridians. For visual as well as cosmetic purpose I made a broad iridectomy in the vertical axis of the left eye, which was followed by an immediate gain of $\frac{5}{200}$. In a few weeks' time this improved to $\frac{15}{200}$, and has remained in *status quo*. Prior to operation there had been but $\frac{1}{200}$ of normal. During the subsequent period that the patient has been under observation reading power has increased to Snellen 1.50

D. at about 15 cm., with but slight amplitude of accommodation. I found that conjunctions and prepositions were read with fair facility, while polysyllables were hesitatingly deciphered. Glasses do not improve her vision, either for far or for near. Owing to a still prevailing, though much abated nystagmus, I have been unable to gain any definite knowledge of the field of vision, or to make a very satisfactory examination of the fundus of the eye, having but twice during the numerous examinations, made at various times, gained only a fugitive glance at the optic nerve. The periphery of the retina as far as discernible is especially normal, though the ascending superior vein and artery seem to be somewhat below the average standard in blood caliber.

The excessive nystagmic movements have become very much reduced since the recovery from the operation, and her color sense, tested by the Thomson color-test for railway employes, has been found to be normal.

A CASE OF HYSTERICAL AMBLYOPIA ASSOCIATED WITH NEURASTHENIA.*

BY W. F. SOUTHARD, A. M., M. D.,

SAN FRANCISCO, CAL.

PROFESSOR OF OPHTHALMOLOGY, OTOTOLOGY, ETC., COLLEGE OF PHYSICIANS AND SURGEONS, SAN FRANCISCO.

ILLUSTRATED.

Mr. J. W., aged 35, bank clerk, was referred to me November 30, 1895, by Dr. T. B. Wing, of Tacoma, Wash. The patient gave the following history of his case:

Has always been a remarkably healthy man, capable of great endurance until within the last three years. About this period heavy responsibilities were thrown upon him which began to effect his nervous system, and he was obliged on several occasions to give up work on account of nervous prostration. A few days rest usually was all that was necessary to enable him to again resume his place at his desk. About three years ago, he commenced having slight attacks of dizziness which always followed unusual mental strain, later on these attacks became more frequent and attended with nausea and vomiting. Tinnitus also began to cause him great annoyance, which usually disappeared after lying down for a short time. Within the past two or three months he for the first time noticed that his vision was becoming indistinct, especially for objects situated outside of the visual line. Of late he has suffered with severe pains in the head whenever he has an attack of giddiness, for this reason he has been obliged to discontinue all use of his eyes. When attempting to read, letters and lines appear to run together. He says that he has got to that point when, if relief is not obtained, he fears that he may become insane. He continually feels that he is on the brink of some terrible catastrophe.

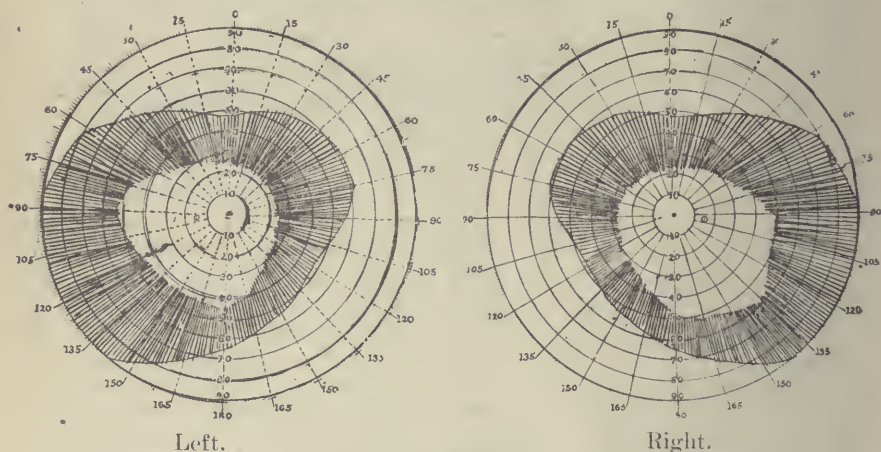
Status Praesens—The patient is a remarkably healthy appearing man of full habit, but exceedingly nervous in all his actions. An examination of his eyes, for which he came to consult me, reveals the following: V. O. D. = $\frac{20}{200}$ $\frac{20}{50}$ w Sph. — 0.5 D. \ominus Cyl. — 1.00 D. ax. 180°. V. O. S. = $\frac{20}{60}$ $\frac{20}{40}$ w Sph. — 0.5 D. \ominus Cyl. — 0.5 ax. 180°. This corresponds with the glasses given him by Dr. Wing, and which he is now wearing.

Objective examination—Javal, O. D, 1.25 D. ax 90 or 180°. O. S. 0.50 D ax 90 or 180°. Adduction, 18°; abduction 2°; exophoria, 1°;

*Read before the ophthalmological section of the Twelfth International Medical Congress, Moscow, August 24, 1898.

hyperphoria, 0° . Skiascopy under homatropin does not materially change the above results. Ophthalmoscope examination: Entirely negative, nothing abnormal being found at the time of examination. A drawing of the fundus of both eyes was made on Haab's colored plates. Field of vision: Chart I shows not only marked contraction but remarkable symmetry in the two fields. Reflexes and color sense normal.

Examination of the ears shows a perfect normal condition of membrana tympani. Patient says that he has been hard of hearing for some time, especially in one ear; at the present time hearing is normal. The tinnitus is not a constant symptom, but is sometimes absent for several days in succession. At no time is it loud enough to materially interfere with hearing. After his examination he expressed a desire to have new glasses made in order that he might be able to see with the same distinctness as with the trial glasses. I gave him a formula for the cylindrical glasses only, leaving off the

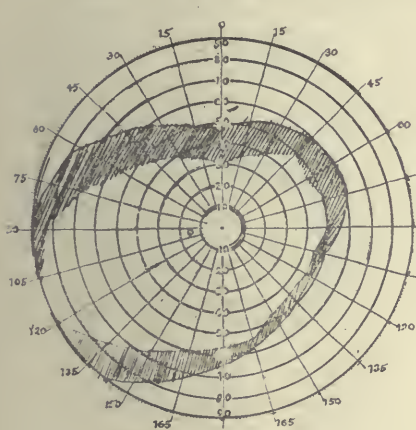


weak sphereals, and he left for the southern part of the state on the following day. During his sojourn in the south I received several letters from him. In the first he says that he has visual disturbances, which are very annoying. He is unable to judge accurately the position of objects in space, *e. g.*, when he comes to steps he can not say whether they are descending or ascending. After mounting a bicycle, getting into a carriage, or boarding a street car, "I seem to be," he says, "forty feet in the air, and the ground appears to be rising in front of me during the time I am in motion." Looking at a grated window, sometimes the perpendicular bars, sometimes the horizontal, appear the most distinct. The images of the perpendicular bars are usually the most persistent.

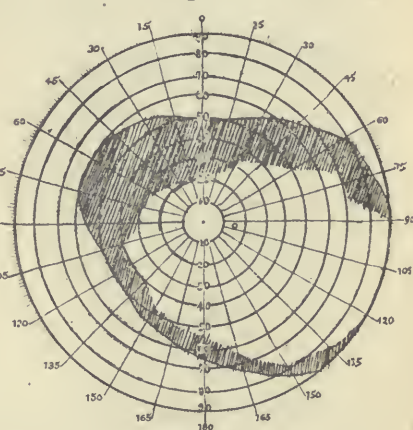
A few days later, he writes that he is greatly encouraged; he can now read for a longer period than formerly without much disturbance. It appears from this letter that he was then able to read from one to two hours continuously. Most of his delusions and illus-

ions had disappeared, but his judgment of distance and height was still defective. General health continued to be good.

During the patient's absence I received a letter from Dr. Wing of Tacoma, in answer to one of mine. He informs me that our patient was a man who had been over-worked for several years, and that he always worried about business matters more than was necessary. He first consulted the doctor three years ago on account of his eyes; at this time he complained of dizziness and inability to use them for more than a few minutes continuously. Compound myopic cylindrical glasses were prescribed, which he wore with great comfort for two years when a slight change was made in them, and another year passed without any serious disturbance. Since the present nerv-



Left.



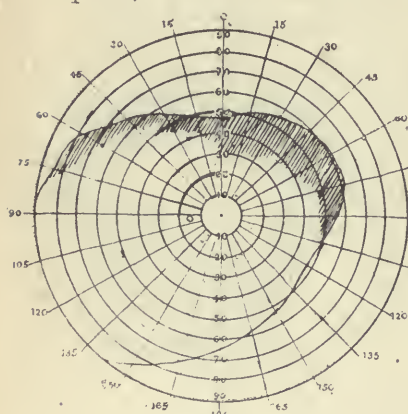
Right.

ous break-down Mr. W. has not been himself; he has appeared like a person on the verge of insanity, and he is alarmed at every unpleasant symptom, many of which he is ever magnifying. A spot before his eye or slight vertigo frightens him nearly to death, and he rushes off at once to his physician for advice.

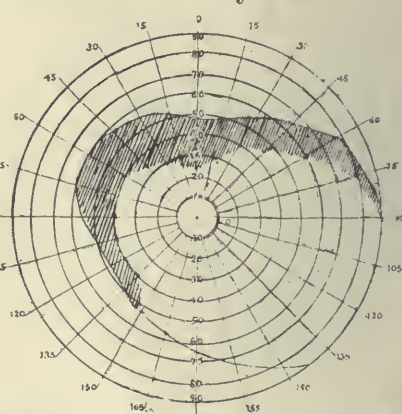
January 2, 1896. the patient returned from the south this morning and immediately came to the office. In the first he states that his headache, pain in the eyes and inability to sleep are about overcome; on the other hand he is unable to use his eyes continuously for more than five minutes without severe attacks of giddiness. About this time I learned that there had been a suggestion that

the patient might be suffering from some affection of the brain, which it was thought might account for his exaggerated nervous condition as well as the peculiar psychological symptoms related by the patient. He asked me if I thought that there was any likelihood of a tumor growing in his brain. At the time this record was made, January 2, he said that his headaches frequently obliged him to lie in bed for a day or two before recovery. He still had a few illusions. Chart 2 was made at this visit. It will be seen that the field has greatly and symmetrically enlarged in both eyes.

January 9, Chart 3 was made, which shows a still further widening of the visual field. On January 15, I made Chart 4. Another ophthalmoscope examination, at his request, reveals no abnormality whatever. A day or two



Left.

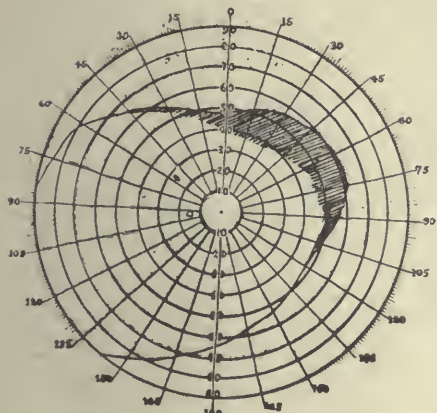


Right.

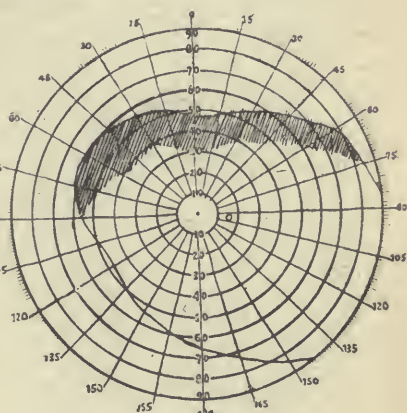
later patient left for home, feeling nearly well. February 10, Chart 5 was made by Dr. Wing and forwarded to me. The field is very nearly normal in both eyes. In a letter received from the patient soon after his return home, he writes that he is feeling well, that he is steadily improving, and can read without any distress for two or three hours daily. Dizziness and tinnitus also has entirely disappeared; hearing normal in both ears, yet there were times when he declared most positively that he could scarcely hear a sound with one ear. I prescribed for him exercise with prisms which he used three times daily with, as he states, a great deal of comfort. In March I received

a letter from the patient and one from his physician, Dr. Yocum, stating that he had just recovered from an unusually severe attack of dizziness and vertigo of such a peculiar nature, that I take the liberty of giving it *in extenso*.

Returning home one day, after having driven a spirited horse, as he stepped out of the carriage he noticed that all objects had a most unnatural appearance. In reply to a question as to just what he meant by this statement, he said "everything looks queer." The following day while seated at the dinner table he suddenly discovered that every movement necessary to be made in the act of eating and drinking required a special concentration of



Left.

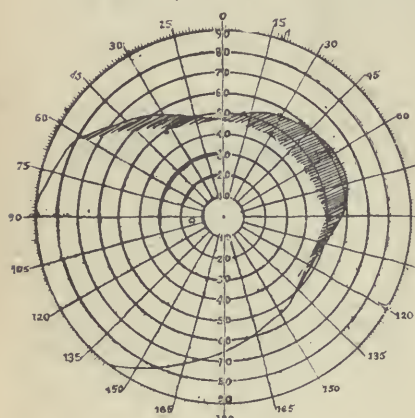


Right.

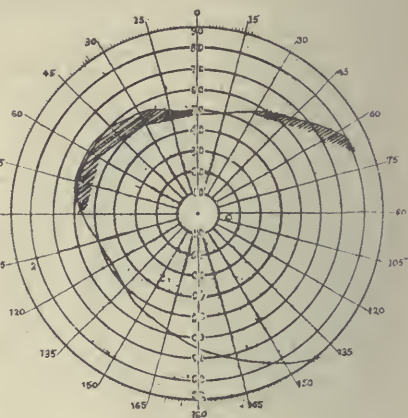
his faculties upon that single act before he was able to accomplish it. If he inclined his head forward, there was immediately a tendency to drop his head upon the table before him unless he made a strong effort to resist the tendency. Before the end of the meal he entirely lost his power of co-ordination, and the function of eating and drinking ceased. His face became greatly congested, and for the first time his family became aware that he was not himself. He was assisted to a couch but a few feet distant, when he at once passed into a state of *apparent* unconsciousness. He writes that he was not unconscious, but that the effort to speak a word appeared to him to be so difficult that he ceased to even make the attempt, although he was conscious that he was being questioned by those about him. Later in the day he was able to answer

questions put to him by his wife and physician, but very slowly and somewhat unintelligently. He writes me that at this time he felt a most tremendous pounding in his head, accompanied with frightful pain in the occiput. He finally walked up stairs to his room, undressed himself and went to bed.

His physician writes me that during this attack, his pulse was excited and full and his pupils dilated. The treatment was full doses of bromides combined with chloral hydrate. In a few days he was about, as usual. Later when he discovered premonitory symptoms of an attack of vertigo coming on he immediately laid down, and thus



Left.



Right.

warded them off.

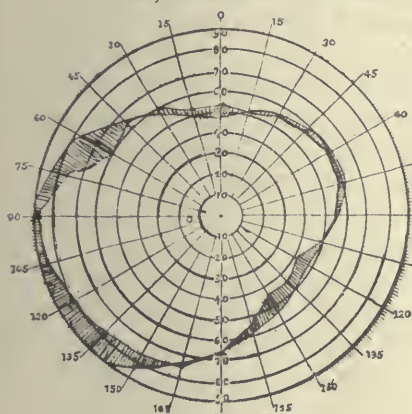
On May 1, 1896, the patient writes that he is entirely free from headaches and dizziness. At the suggestion of his physician, he has given up all work for the present. He says that he has had a few premonitory symptoms similar to those preceding the severe attack of dizziness and vertigo of two months ago, but by immediately lying down they pass away without any serious results.

In a letter from Dr. Yocum, are given substantially the same points as those already related by the patient himself. Some months later, at my request, his field was taken by Dr. Wing, which is No. 6, and shows a very nearly normal condition of the field. The slight contraction of the field is hardly to be considered. In the last report which I have had from him a few months since, I

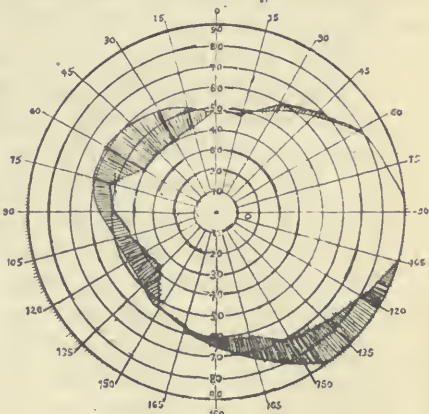
learned that he is in his usual health. He has no marked trouble with his eyes, and all his subjective symptoms have disappeared. He has changed his occupation and lives a more out-of-door life.

REMARKS.

Nervous amblyopia or hysterical amblyopia does not depend upon pathological changes either in the retina or visual centre, the disturbance being simply functional or reflex. In patients suffering with hysterical amblyopia, the loss in the visual field is generally, though not always, concentric, binocular and symmetrical. It is more frequently found in females as a reflex disturbance from the ovaries or uterus. Cases of complete blindness (amaurosis) have been found. These are marked by sudden-



Left.



Right.

ness of onset and rapid disappearance, but may, in rare cases, last from a few hours to several days.

The writer some years ago had a case of complete hysterical blindness in a school girl of 18. The attack came on about noon, just after her return from a final examination. It was some hours before she acknowledged that she could distinguish light from dark. During this time she did not appear to be in the slightest degree excited, not half as much as those about her. It was several months before the vision was completely restored. One of the marked complications of this case was spinal irritation which, however, was not located invariably over the same portion of the vertebra, but showed a tendency to rapid changing of position from day to day and, at times,

from hour to hour. This patient made a complete recovery in a few months, strychnia, electricity and massage being the treatment employed.

Attacks of amblyopia may come on suddenly, or may be preceded by premonitory symptoms, such as rapid tiring of the eyes from overwork or exposure to bright light. Nervous shock may be considered as an exciting cause, as in the severe attack of our patient after the excitement from driving a pair of spirited horses.

During repeated and prolonged tests of the visual field, it has been found that it becomes more and more contracted each time that the test is made; this is known as the fatigue field,* and is one of the strongest evidences of hysterical amblyopia. This was noted to some extent, though it was not a marked symptom in our case, yet care was taken to eliminate it as much as possible.

The reflexes are usually normal unless complicated with organic disease, as for example, tabes. Peripheral narrowing of the field of vision due to errors of refraction I feel sure does not infrequently exist. In two of my own cases the perimeter showed quite marked contraction of the field, which entirely disappeared after correction of the refractive error. It is possible if a perimetric test be made in all cases of refraction accompanied by headaches, especially among neurasthenics and asthenopsics, we should find a greater or less degree of contraction of the field. It must also be borne in mind that even in extreme cases, patients go about with perfect safety, even where there is a marked loss of the visual field; such is not the case when there is a like amount of contraction of the visual field due to diseases of central origin. This, together with the fact that there is an entire absence of demonstrable pathological change in the retina or optic nerve, and the usual complete recovery in these cases serve to make the diagnosis as a rule comparatively easy. The severe pain of the head experienced by our patient, I think, may be explained in part by his error of refraction, as also his optical illusion for seeing perpendicular more distinctly than horizontal lines.

Certain well marked phenomena attending this case were

*Swanzy, Am. Ed., page 505.

very strongly suggestive of Meniere's disease. Dizziness, giddiness, vertigo, nausea, fear, tinnitus, momentary or partial loss of consciousness, desire to lie down during premonitory symptoms, and apparent partial loss of hearing comprise a group of symptoms which, taken by themselves, most unmistakably point to disturbance of the semicircular canal as the cause of the trouble. There were no evidences of disease of the ear, no history of inflammation even in childhood, and there was also no history of syphilis. It is well known that such subjective symptoms as dizziness, vertigo, etc., are frequently due to eye strain. It may be possible that this whole group of symptoms so remarkably simulating Meniere's disease may be due to disturbance of the vaso-motor nerves through eye strain. On the other hand, it would be interesting to know if, in undoubted cases of Meniere's disease, the visual field ever shows contraction and such disturbances in the eyes as in the present case. If so, they must be exceedingly rare, for I have not been able to find a case resembling this, after dilligently searching the literature of both diseases. When we consider all the facts in this case, the character and sequence of the symptoms commencing with eye strain, followed later on by an attack of nervous prostration in consequence of mental overwork, gradual loss of power of "fixing his mind upon his work," (the patient's own language) mental worry, vertigo, dizziness, tinnitus, symmetrical contraction of the visual field, his convulsive attacks, his physical disturbances, and, finally, his appearance of perfect health in spite of this train of symptoms, his ability to go about as he pleased regardless of his contracted visual field and his rapid recovery, appears to me to warrant the diagnosis of hysterical amblyopia superinduced upon an attack of neurasthenia.

From either point of view the case is an interesting one, and I trust will not be considered too trivial to present to such a learned body as the ophthalmic section of the International Medical Congress.

SCLERODERMIC PAPILLOMA OF THE LOWER LID.

BY W. CHEATHAM, M. D..

LOUISVILLE, KY.

W. M., 61 years old, blacksmith, reported to me stating that fifteen years ago he was burned on the right lower eyelid by a piece of metal, which left a small white spot. Four years ago this spot began to enlarge, being quite painful at times.

Examination showed the growth to be very hard and uneven and scaly. It did not show any signs of ulceration. The patient stated that he had poulticed the growth which, he asserted, softened it very much. He believed that the growth was not as large as it had been.

The mass springs from the conjunctival surface in the edge of the lid, the cilia can be recognized. It is not attached to the eyeball in any way. Its greatest breadth is at its temporal end. Vision with that eye equalled 20/70.

Examination by Dr. Cartlidge showed that it was a sclerodermic papilloma, with an extremely narrow base.

I removed the growth with a pair of scissors without the employment of any anesthetic, closing the gap left at the external canthus, by this the skin of the lower lid was lifted, making an excellent lid, though when the patient is asleep much of the globe is left exposed. No enlarged glands could be found.

July 13, 1898, the lids are now closed when asleep.

ON THE QUESTION OF PARTIAL OR COMPLETE
CROSSING OF THE OPTIC NERVES IN THE
CHIASM OF THE HIGHER MAMMALS.*

BY PROF. W. V. BECHTEREW.

ST. PETERSBURG.

Translated by Dr. Wendell Reber, Philadelphia.

The question whether the optic nerves cross completely or only in part, has until lately been a matter of almost daily neurologic discussion. Most investigators have pronounced in favor of incomplete crossing in the higher mammals and especially in man, basing their decision on clinical and anatomical data. Recently, however, Kölliker, one of our greatest anatomists, has declared in the latest edition of his work on Histology, (as also at the Congress of Anatomists in Berlin) that the optic nerves cross *in toto*, and there have also appeared lately some clinical reports with evidence pointing in this same direction. The fact of the matter is, that with all due respect to both contentions, the question cannot yet be considered as definitely settled. Nor is it to be cleared up by clinical and anatomical findings only, for this is a field in which neurophysiology may play an important part. In the latter connection may be mentioned the labors of Knoll and Brown-Sequard,† the former of whom showed that section of one optic nerve produced blindness of the same eye with dilatation of its pupil; that section of the tractus of the same side produced a similar condition of things, occurring, however, in the opposite eye. Unfortunately, I have not been able to refer to Knoll's original article to learn on what animals he conducted his experiments, a fact of no little importance to this discussion.

Brown-Sequard's researches were made on guinea pigs

**Neurologisches Centralblatt*, March 1, 1898.

†Eckhard's *Beitrage zur Anatomie und Physiologie-Geissen*.

and rabbits* and included section of the tractus; division of the chiasm antero-posteriorly; and destruction of the external geniculate body and corpora quadrigemina on one side—in consequence of which all kinds of visual lesions resulted; for instance, with section of one tractus blindness of the opposite eye occurred; after injury to the chiasm, total blindness of both eyes were observed. Among the important conclusions announced as the result of his investigations may be mentioned the following:

1. The presence of but one cerebral hemisphere is sufficient for the act of binocular vision.

2. The amaurosis following upon injury to the tractus, the external geniculate body, the corpora quadrigemina and other portions of the corresponding hemisphere, is not the result of functional disturbance in the optic centers, but due, rather, to the influence of the irritation at the site of the lesion over the nutrition of the eye or optic nerve in question:

As might have been expected, this announcement did not satisfy the clinicians and physiologists. Critical examination of the report of Brown-Sequard's experiments showed that he had used animals concerning the total or partial crossing of whose optic nerves there had been nothing definitely shown.

Gudden endeavored to prove that the optic nerves of rabbits crossed completely; with but doubtful success, however, for in every case there was found a certain proportion of crossed fibres, although that proportion was very small. In subsequent experiments by Nicati,† conducted on cats, total blindness either in both eyes or one, could not be produced by antero-posterior section though the chiasm, which would argue for partial crossing only of the optic fibres, at least in this animal. My own experimental work on dogs‡ agrees entirely in its results with Nicati's findings. After the section through the chiasm, the dogs did not become totally blind, but undoubtedly recognized and walked carefully around articles placed or

**Arch de Physiol, norm. et pathol.*, Bd. IV., 1872.

†*Centralblatt f. Med. Wissensch.*, 1878, S. 449.

‡W. v. Bechterew—*Experimental-untersuchungen ueber die Kreuzung der Schnerven im Chiasma Nervi Opticorum. Neurol. Centralbl.*, 1881.

held before them. The only noticeable result was a certain divergence of the visual axes, but the pupillary reactions remain intact. Section of one optic tract in the dog was found to produce bilateral hemianopsia, with contraction of the remaining halves of both fields. In my earliest work I was not able to map out the defects in the remaining halves of the visual fields with any satisfaction to myself, and thus offer convincing proof of the existence of contractions. Albeit, in my later series of sections of one optic tract in dogs, I found that the contraction of the visual field was much more marked in the opposite eye (*contra-lateral auge*) than in the eye on the same side as the injury. Moreover, the defect in both fields was sharply discontinued at the vertical line. The vision seemed to be much impaired in the opposite eye, while that of the eye on the same side as the injury apparently escaped entirely. Destruction of the external geniculate body or more of the optic path produced about the same condition of things, namely, bilateral hemianopsia with shrinking of the remaining fields. As in the preceding experiments, the shrinking of the half-field was greater in the eye opposite to the lesion.*

These experimental lesions induced no especial change in the pupils according to my early investigations. In my later work, however, I demonstrated the presence (after section of the tractus) of the so-called Wernicke's hemianopsic pupillary reaction as found experimentally (dogs) by some workers,† and by Wilbrand in the human subject. In some of these experiments the pupil of the contralateral eye seemed under ordinary illumination to be a trifle wider. It must also be stated, on the authority of Ferrier, that section of the tractus opticus in apes has, as its consequences, bilateral homonymous hemianopsia, with hemianopsic pupillary reaction. This fact, so far as physiology goes, does away with all doubts as to the partial crossing of the optic fibres in the chiasm of the higher mammals; and imposes on anatomists and clinicians the burden of *proving* total crossing of fibres; unfortunately

*W. v. Bechterew, *Neurol. Centralbl.*, 1894, No. 22.

†Compare for instance, Sinani-Vers. d. psych. gesellsch, in St. Petersburg, 1883.

for them, anatomic and clinical findings are not the sole deciding factors. The foregoing physiologic experiments must be entirely negatived before the question can be interpreted from the anatomists and clinicians standpoint only.

As for the occurrence of partial crossing of the optic fibres in man, there is little, if any doubt, concerning it among the majority of clinicians. Any clinical reports sustaining Kölliker's postulate of complete crossing, are confronted with the most contradictory evidence. To my mind, the day is not far distant when the present conceptions as to the crossing of the optic fibres will become a fixed scientific fact, and any attempt at a further discussion of the question will be looked upon as gratuitous.

ABSTRACTS FROM RECENT FRENCH OPHTHALMIC LITERATURE.

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QUARTER ENDING JUNE 30, 1898.

Treatment of Corneal Maculæ by Massage.

MALGAT, J., Nice. (*Recueil d'Ophthalmologie*, March, 1898.) Malgat recommends massage for the removal of all grades of corneal infiltration, particularly in young children, as they are not pressed for time as is so frequently the case with adults. His usual method is to introduce a small amount of a one per cent. strength of yellow oxide of mercury ointment beneath the eyelids and then to lightly rub the cornea through the closed lids for half a minute's time. This procedure is to be repeated daily until the eye commences to show signs of irritation, when the treatment should be discontinued. When all irritation has passed away the method is to be resumed, and is thus continued until the desired result is obtained. After each treatment the eye is washed with a three per cent. strength of boric acid solution. This method should never be employed until at least ten days after the causative inflammation has subsided. The plan is contraindicated in the case of staphylomas of the cornea or where there is attachment or hernia of the iris; the briefer the period intervening between the attack and the commencement of the treatment, the briefer is the time that is required and the better is the chance of success. His statistics, which he publishes in full, show one hundred and twelve cases treated in this manner, with the following results: Cured ninety-one cases, benefited eleven, and ten cases left before treatment was concluded.

The Cure of Purulent Ophthalmia by the Proteinate of Silver (Protargol.)

DARIER, A., Paris. (*La Clinique Ophthalmologique*, March 25, 1895.) Further investigations have confirmed Darier in the favorable opinion he had already formed of this salt (see April, 1898, number of ANNALS OF OPHTHALMOLOGY for abstract and reference) from which he is led to conclude that it is the most efficient of all the silver-salts in cases of purulent conjunctivitis. For general employment the twenty per cent. strength solutions should be employed, but he says that it may be used without danger in solutions of strength as high as fifty per cent. He recommends the employment of the ten to fifteen per cent. strength solution as a prophylactic measure in cases of infants who are born of mothers suffering from vaginal inflammation. With his article he publishes a note from Neisser in which the bactericidal action of Protargol as compared with the other salts of silver, particularly in regard to their action upon the gonococcus, is spoken of favorably. He has found that the action of Protargol is practically painless.

Lesions of the Eye and Its Adnexa from Obstetrical Disturbances.

TRUC, H., Montpellier. (*Annales d'Oculistique*, March, 1898.) Three cases of this nature which came under Truc's personal observation are reported. The first was one of linear leucoma following a wound of the right eye. There were ecchymoses and edema of the left eyelids, with a non-paralytic convergent strabismus on the same side. Another case consisted in a paralytic ectropion of the right lower eyelid with partial facial paralysis. He accompanies their histories with a resume of similar cases on record and concludes his article on the subject with the following assertions: Ocular lesions following normal labor are apt to be of slight importance, generally consisting in varicosities, ecchymoses, retinal hemorrhages, phlyctenulæ, and edema of the eyelids. Rarely there is chemosis. In one instance, hyperemia was noted.

Ocular lesions following artificial labor (besides those mentioned) are: Exophthalmos with retro-bulbar hemorrhage, fractures of the orbital bones, palpebral palsies,

keratitis, optic atrophy, and astigmatism with convergent strabismus. In one case avulsion of the globe was noted.

Use of the forceps is the usual cause of these troubles. The lesions produced by them are variable, being grave when the instrument produces a fracture of the orbital walls, and relatively, slight when it simply presses on the eyeball. In the first case the lesions are usually beyond aid and as a rule death ensues. In the second instance resolution with preservation of vision takes place quite rapidly.

A Case of Ectopia of the Crystalline Lens.

DE LAPERSONNE. (*La Clinique Ophthalmologique*, April 25, 1898.) The patient reported by de Lapersonne was a boy six years old who was brought to his clinic on account of defective vision. Examination by oblique illumination failed to reveal the presence of anything abnormal in the anterior portion of the eye. There was no nystagmus nor were there any malformations of the external appendages. The pupil was central and the iris contracted normally. No corectopia nor any inequality of the depth of the anterior chamber could be recognized. Under a medium dilatation of the pupil, examination with the direct image showed that the pupillary areas were traversed by a dark curved line, the concavity of which looked upward and slightly outward. This line was clearly defined on its lower edge, and from this portion gradually faded away toward the center. With complete dilatation of the pupil the lens was found to occupy the upper and outer two-thirds of the pupillary space. A double image of the fundus which failed to show any evidences of the disease, could be plainly seen.

The fibres extending from the lens to the ciliary body, which d'Aeuch has claimed to have found in such cases and which he considered to be composed of debris from a distended zonule were searched for, but could not be found. Uncorrected vision in each eye equalled one-hundredth of normal, while with the best correction that could be obtained it rose to one-eighth of normal, this being accomplished with a concave spherical lens of three and a half diopter's strength. On account of the age of the patient, however, the result that was obtained may

not have been as good as might have been gotten with an older subjects who could give more accurate answers. The child also presented other deformities; an inguinal hernia on the left side with ectopia of the testicle and a talipes valgus which had been ameliorated by treatment.

The author agrees with the distinction between cases of true ectopia lentis and congenital dislocation of the lens made by Manfredi, placing his own case in the former category. With Becker and Klein he holds that the cause of the condition is probably a failure of development of the infero-internal part of the zonule—the part corresponding with the retinal cleft; the lens being dragged in a direction that is diametrically opposed by the fibres of the suspensory ligament.

As regards treatment, his idea was to re-estimate the refraction of the eyes a year later when the child's answers would be more reliable, an additional object being to determine definitely whether prisms would be of any benefit. If, after such a trial, the visual acuity did not improve, a fair time being allowed, he would perform discission.

**A Case of Epliscleritis Complicating Zona Ophthalmica
Cured by Electrolysis.**

CLAVELIER, Toulouse. (*La Clinique Ophthalmologique*, April 25, 1898.) Clavelier makes a brief report of a case which he believes to be the first reported example of zona ophthalmica attacking the sclera. A few applications of electricity effected a cure.

On the Herpetic Forms of Keratitis and Their Treatment.

GALEZOWSKI, Paris. (*Recueil d'Ophthalmologie*, April, 1898.) In accordance with their etiology, Galezowski divides herpes of the cornea into the following classes:

1. *Herpes of Influenza*.—In this category he also includes herpes from eruptive fevers and other distinctly febrile conditions. These, he says, act upon but one branch of the trifacial nerve producing a peripheral neuritis, this being the condition that is generally spoken of as phlyctenular keratitis, and the one which is allied in nature to phlyctenular conjunctivitis. The treatment, in such cases, should be both local and general.

2. *Herpes of Malaria*.—The treatment recommended

for this type is quinine internally, combined with the local employment of iodoform ointment and the alternate use of miotics and mydriatics.

3. *Neuro-paralytic Herpes*.—In this division he places such cases as those that arise from irritation caused by dental troubles, etc. The treatment consists in the removal of the cause and the employment of the same local treatment as recommended in the other two types.

4. *Neuro-paralytic Herpes of Central Origin*.—In this condition all three branches of the trifacial nerve may be palsied or the first may be the only one that is paralyzed, the others being only paretic.

5. *Neuro-paralytic Herpes of Syphilitic Origin*.—In this type of cases the lesion frequently consists of a gumma involving the ganglion of Gasser. The portions near this ganalion may also become inflamed, giving rise to similar symptoms. The treatment for these cases consists in the exhibition of mercury, preferably by inunction, in association with the following local measures: (a), the alternate use of mydriatics and miotics; (b), the application of hot compresses several times daily; and (c), the introduction of either yellow oxide of mercury or of calomel ointment combined with cocain between the eyelids.

6. *Herpetic Keratitis from Eczema*.—This form is associated with the general condition—appearing in early life and in feeble subjects.

A New Communication on the Employment of Cocaine in Ophthalmology.

GERMAIX, Algiers. *Recueil d'Ophthalmologie*, April, 1893.) Germaix reports two cases of marked depression following the use of this drug during plastic operations. He sums up his article by the following conclusions:

1. Where several areas are to be operated upon, cocaine should be injected into but one spot at a time, followed immediately by the operation in order to allow a prompt elimination of the drug.

2. Great prudence should be exercised in its use in emaciated patients, or in those suffering from cardiac affections. Even in these cases, however, the action of the drug is not so dangerous as are the effects of general anesthesia from chloroform.

3. Reliable preparations of the drug should alone be used, as some are more dangerous than others.

4. When employed, a solution of caffeine should always be at hand for immediate use when necessary.

5. As a result of his own experience, he states that even the gravest cases that have come under his notice have always recovered under the action of caffeine, the patient being placed in the dorsal decubitus with the head lowered.

On the Extraction of the Crystalline Lens Dislocated Into the Anterior Chamber.

DESPAGNET, F. (*Recueil d'Ophthalmologie*, April, 1898.) After making note of the difficulties at times attending the removal of the crystalline lens after it has been dislocated into the anterior chamber, Despagnet reports the details of a method which he has successfully used in such a case—a method, however, for which he does not claim any priority. He first transfixed the lens with a Bowman's needle, thus holding it against the posterior surface of the cornea in such a position that a curette was readily passed beneath it. In this manner he avoided the excessive loss of vitreous humor which is said to be such a frequent and dangerous accident in these cases. With this same end in view, he also discarded the use of a speculum, having an assistant hold the eyelids apart with the fingers.

Opening of the Iridian Angle.

VALUDE AND DUCLOS, Paris. (*Annales d'Oculistique*, April, 1898.) In a continuation of an article published in the February number of the same journal, the authors discuss the anatomical changes which are the result of the operation in question. They call attention to the fact that Taylor's studies were all made upon the eyes of dogs which in the anatomy of the parts in question differ from those in man. The experiments described in this paper were all made upon the eyes of infants ranging in age from sixteen days to three and a half years. In all, sixteen eyes were examined. The authors' conclusions are as follows:

1. The operation is identical with the internal sclerotomy of de Wecker and should be known by the name, "Opening of the iridian angle."

2. The operation, as a rule, is harmless, and the incision of the limbus is insignificant though its field of action is limited. After opening of the angle in glaucoma, the eyeball gradually loses its increased tension and the ocular tissues insensibly, resume their positions. Pro-lapse of the iris with entanglement in the wound is rare. The use of specially adapted needles is of advantage in cases in which the anterior chamber is shallow.

3. Clinical experience has shown that the operation is of advantage in prodromic glaucoma and in certain chronic forms of the condition. It is the operation of choice in hydrophthalmus.

4. The most frequent anatomical results encountered during the studies were lesions of the canal of Schlemm and intrascleral veins, as well as an opening of the suprachoidoidal serous space by tenotomy of the ciliary muscle.

5. The instrument used does not open the limbus throughout the length of the incision. It incises the summit of the angle through barely half of the incision that is made.

6. Upon account of the blade of the von Graefe knife being difficult to manipulate, it makes a deep section. It cuts the ciliary muscle and penetrates into the suprachoidoidal space. Upon the contrary, the needle of de Vincentiis makes a clean, well limited cut, and handled as Taylor advises, it incises the sclerocorneal tissue. The needle of Valude, the point being used, tears the base and the sides of the angle.

On a Case of Transient Amblyopia Following a Hemorrhage, and on One of Recent Double Amaurosis After Hematemesis.

BORSCH, Paris. (*Annales d'Oculistique*, April, 1898.) The first case reported is as follows: A thirty year old man was kicked in the right breast by a cow. Leeches were applied for the ecchymosis and allowed to come away themselves. During the night a profuse hemorrhage followed. The next morning the patient awakened feeling very weak, and was surprised to notice a haze before his eyes which during the next twenty-four hours grew so bad that he was scarcely able to see to move around alone. At this time the pupils were dilated and the reaction of the

irides was abolished. The ophthalmoscope showed the retinal arteries to be contracted and the corresponding veins dilated. The optic disc was slightly swollen and the retina was "veiled." Vision with the right eye was reduced to one-tenth of normal while that of the left eye had fallen to one-fifteenth of normal. The patient claimed to have had excellent vision before the accident, and not to have had any previous disease. An examination of the blood showed, besides an anemia, a condition of "anhematism" and a considerable augmentation of hematoblasts. Rorborant treatment by the use of "syrup of Cheron" restored the vision in fifteen days, when a second examination of the blood showed it to be normal. From this the author concludes that an amblyopia or an amaurosis following a single hemorrhage generally recovered.

The second case was seen in a forty-two year old man with the history that five years previous he had received a severe drenching. From that time he suffered with "malaise." A month later he was attacked with violent cramp-like pains situated in the jaws and the stomach. These commenced almost an hour before meals and lasted until about an hour after eating. He stated that they were worse after he had been eating meat. At first he had these attacks every three or four days, but they soon became more frequent. In about a year's time he commenced to have attacks of vomiting. Each evening about ten or twelve o'clock he would have a stifling feeling which was followed by emesis that gave almost instant relief. A few months later he was attacked with "a feeling of heat which mounted to his head," this being followed by epistaxis and hematemesis. After a third attack of hemorrhage he noticed failure of vision. Two days after this he had a most violent attack of hematemesis which left him unconscious for forty-eight hours from which he recovered blind. At the time of the first examination in May, 1896, vision was *nil*. There was paralysis of the left external rectus muscle. The pupils were dilated and regular in outline. The irides failed to evidence any reaction. The optic nerve-heads though atrophied were not diminished in size. The retinal vessels were contracted without any appreciable change in their walls; and there

were no signs of old hemorrhages or previous inflammation. After a treatment by subcutaneous injections of strychnine for a month's time, he gained light-perception.

In explanation the author offers the following suggestion: The hemorrhage drained the sheaths of the optic nerves. This was followed by a serous effusion that produced pressure on the nerves. Added to this, and probably of still greater importance, was the possible influence of toxines.

In conclusion, the author gives an extended and detailed account of the opinion of others who have reported similar cases, and has most properly, concluded that no one explanation can be accepted for all such cases.

Report of Two Cases of Extraocular Traumatism with Their Action on the Muscles of the Eye.

BOURGEOIS, Reims. (*Recueil d'Ophthalmologie*, April, 1898.) The following cases are reported at length by the author with an explanation of the action of the traumatism in each.

Case I.—A boy sixteen years of age, while working at a printing press was caught by an ink-carrying plate of forty centimeters in diameter by three in thickness in such a manner that it pressed against the left temporal region; the right side of the face being squeezed against a wall. With a twisting move he tried to free himself, when, fortunately, the plate having come to the forward end of its stroke, started back and he was liberated.

There were no general symptoms of traumatism or of shock, although a hemorrhage from the right auditory canal which was supposed to be due to rupture of the drum-head, gave suspicion of cranial fracture. In addition there were paralyses of the left facial and the right sixth nerves which yielded to the use of a battery.

The author attributes the cause of the ruptured drum membrane to compression of the air in the external auditory canal. The palsies he believes to have been probably caused by rupture of a fine vessel at the level of the common nucleus of the abducens and of the facial nerves. He then states, granting that the facial nerve is direct in its action, that this would lead to the belief that the action of the abducens is crossed.

Case II.—This was seen in a boy of fifteen years of age who was struck at the inner extremity of the left eyebrow by a bullet which had bounded from a target at which it had been shot. There were no signs of any foreign body in the wound, but there was palsy of the left internal rectus muscle. After taking into account all the possibilities to explain this strictly limited paralysis, the author ascribes the condition to the probable penetration of a fragment of the bullet into the orbital cavity cutting the motor branch of the nerve to the affected muscle.

**Hemorrhagic Retinitis Due to Combined Syphilis
and Arthritis.**

GALEZOWSKI, Paris. (*Recueil d'Ophthalmologie*, March, 1898.) Galezowski notes a case of the above mentioned condition, the nature of which was proven by the fact that it yielded to the specific drugs for these diseases. He closes his article by the following conclusions, viz: (1), the disease could be attributed to the combination of the two diseases; (2), that an albuminuria which appeared during the course of the malady was passing and accidental, and had nothing to do with the causation of the hemorrhages; and (3), that the favorable result obtained after eight months of treatment was due to the mercurial frictions as to the derivatives and preparations of the salicylates, which latter he considers of the greatest value in the treatment of disturbances arising from the combination of gout and syphilis.

Polypi of the Superior Lacrymal Canaliculus.

PARISOTTI, Rome. (*Recueil d'Ophthalmologie*, March, 1898.) Parisotti records a case of this extremely rare affection. There was a swelling of the upper eyelid in the region of the canaliculus and an almost total closure of the lacrymal duct. A probe revealed the presence of a soft mass in the canaliculus, palpation of which between the fingers gave a sensation of fluctuation around a hard nucleus. The duct was opened as for probing and ! ! ! polypi were removed. Histologically, they were similar to the mucous membrane lining the canal.

Lymphangiectasis of the Bulbar Conjunctiva.

JOCOS. (*La Clinique Ophthalmologique*, May 25, 1898.)

This author reports a case of the above mentioned disease which he believes to be unique in literature. Microscopical examination of the diseased parts showed them to be formed of dilated lymph spaces with fibrous tissue and blood vessels. The cornea was steamy, a condition which yielded somewhat to a circumcision of the limbus conjunctiva. The skin of the face was quite typical of the disturbance.

A Criticism Upon Mules' Operation; a Form of Operative Procedure Destined to Replace It.

BOURGEOIS, A., Reims. (*La Clinique Ophtalmologique*, May 25, 1898.) After mentioning the well-known difficulties and dangers of Mules' operation, Bourgeois suggests that it be replaced by an enucleation followed by the insertion of some non-irritating substance into the wound, the muscles over the whole area being drawn together in front of the inserted object, as is ordinarily done with sponge-grafts. He suggests that a small ball formed of silk over a nucleus of cat-gut or peat, substituted for the sponge. To aid in securing the muscles after enucleation, he suggests that they be transfixed with cat-gut sutures and secured before being excised from the eyeball.

Concerning the Visibility of "X" Rays to Certain Young Blind Persons.

FOVEAU, Courmelles. (*La Clinique Ophtalmologique*, April 10, 1898.) In a general way, Foveau gives some results that he has obtained in experiments with the "X" rays upon the inmates of the French Institution for the Young Blind. As he admits that the diagnoses of these cases were not accurate, details will not be gone into, he stating simply that out of seventy-nine girls and one hundred and twenty-five boys experimented upon, five of the former and four of the latter claimed to have perceived the rays. He states that no patients suffering with optic atrophy could see at all with their aid.

Some Remarks Upon the Technique of Enucleation.

MEYER, Paris. (*Revue Generale d'Ophtalmologie*, May 31, 1898.) In order to increase the mobility of the stump, particularly in a lateral direction, after this enucleation, Meyer gives the following rules: Preserve as far as pos-

sible the adherence between the muscles and the conjunctiva. To do this the conjunctival membrane is to be dissected loose as cleanly as possible and separated from the underlying sclerotic by dissecting down between the extra-ocular muscles. The muscles are then to be drawn well away from the globe, and the capsule of Tenon separated close to it in order to preserve the attachments of the muscles to the capsules. The external and internal recti act much better if their ends are not drawn too closely together, consequently the only sutures employed should be interrupted ones that are introduced vertically. As the conjunctiva is cut so close to the edges of the cornea, it is well to make two horizontal incisions in the conjunctival membrane parallel to the edge of the muscles.

Lesions of the Optic Nerve in Hereditary Syphilis.

SAUVINEA. (*Revue d'Ophthalmologie*, May, 1898.) This author doubts the statement that the lesion usually spoken of as congenital pigmentary retinitis is due to hereditary syphilis. He holds that although it is often seen in association with the general disease, yet it is just as frequently found in patients who are free from any such taint. On the other hand, he mentions a lesion of the optic nerve, which he considers as one of the stigmata of the general affection. The lesion is always binocular. The papilla is more or less discolored, appearing whitish gray or gray in tint. The cribriform fascia of the optic nerve is never visible. The disc is flattened or but slightly swollen. The edges are indistinct, and at times are invisible throughout the entire circumference of the nerve-head or in the segments. The retinal veins are swollen. The retinal arteries are slender, and in places are covered by an exudate which generally extends along the edge of the disc or even passes over to the surface of the nerve head. At times, the origin of the retinal vessels is hidden.

These lesions may or may not be accompanied with a pigmented condition of the retina.

Binocular Optic Neuritis and Pigmentary Chlorio-Retinitis Following Pernicious Fever of the Hot Countries.

ANTONELLI. Paris. (*Revue d'Ophthalmologie*, May, 1898.) The case reported by Antonelli is one of several similar

examples of the above named ocular affections following pernicious malaria now on record. Vision in each eye had fallen to the ability to see to count fingers at 2 meters' distance. The optic nerve heads were white in the center, bordered by a ring of gray with a white ring beyond. The retinal vessels were contracted and could not be seen just after leaving the disc. In isolated areas, the retina presented a stippled appearance, this in some instances being due to ordinary pigmentation, and in others to a typical "bone corpuscle" form of pigmentation. The case, he says, has an important medico-legal bearing from the fact that the disease so closely simulates the syphilitic form of lesion of the eye. Although the case he studied failed to present any symptom of syphilis, and a clear history of the disease following malarial attack while the patient was in government service was given, yet the patient was refused a certificate by one physician the ground being taken that the trouble was specific in character.

False Glaucoma (Ophthalmic Migraine).

PARISOTTI, Rome. (*Annales d'Oculistique*, May, 1898.) The case described by Parisotti was that of a thirty-five year old priest coming from a family with a marked nervous temperament. His mother complained for a long time of headache, vertigo and gastric pains. She also suffered from metrorrhagia. With the exception of some disease of the eyes when an infant, the patient has been well up to the time of the onset of the trouble to be described. When about fifteen years old he noticed that he was becoming myopic. The present trouble began in 1892. One morning while coming out of a church he noticed a fog in front of his left eye, this becoming worse until noon time. After dinner the dimness of vision commenced to clear, temporarily reappearing for a brief period of time before supper. This condition of things existed for nine days in August, throughout September, and for eight days in October. The haze always appeared in front of the eyes before meals, gradually disappearing after them. In May of 1893, the patient came to the author stating that he had continuous headaches, relieved only "for an instant at a time" for the previous five months. The bulbar conjunctiva of the left eye was intensely injected. The cornea was of a

grayish tint. Intraocular tension was increased and the fundus of the eye was scarcely visible upon account of the corneal condition. Use of the eyes was rendered impossible by reason of consequent distressing symptoms. the neuralgia occupying the entire left side of the head. Under the influence of local blood-letting and eserine, with the internal administration of valerianate of ammonia the urgent symptoms disappeared.

In 1897 the patient had two violent attacks, each preceded by an aura. Immediately after the first of these, an examination of the fundus oculi failed to show pulsation of the retinal arteries. Four days later one of the inferior branches of the retinal arteries evidenced a pulsating movement. Intraocular tension was slightly increased. In five days' time the eye had become normal. About two months after this attack, the second one manifested itself. This resembled the first. In each the obscuration of vision was the marked feature. There were circles around flames of light and the patient's temple and cheek were congested. During the exacerbations the field of vision was concentrically contracted, this being more markedly pronounced above.

From day to day the amount of field-contraction varied. The optic disc was slightly excavated, the depression being peripheral. The eyes were highly myopic, the right being much more so than the left. For a long period of time the diagnosis rested between prodromic and false glaucoma, it being finally decided in favor of the latter condition.

Streptococcic Pseudo-Membranous Conjunctivitis and Panophthalmitis Secondary to an Attack of Influenza.

VALUDE, Paris. (*Annales d'Oculistique*, May, 1898.) Valude reports a case of this character, the patient being a young rachitic woman upon whom symphyseotomy had been performed on account of a contracted pelvis. When she had been pregnant seven months and a half she had an attack of la grippe. During this period the temperature ranged from 36.5° C. to 37.5° C. The condition lasted until labor set in. Five days later a false membrane due to streptococci formed on the neck of the uterus. Two days after this, the wound of operation showed infection.

Forty-eight hours later, the left eye, which was shrunken and over which the patient had been in the habit of wearing an artificial eye, became red and irritable. On the following day she complained of a sensation as if "gravel" were in the eye. The eye was inflamed. The next day the conjunctiva was covered with a false membrane. Temperature rose to 40° C.. Two days after this the globe became hard and prominent. At this time there was a swelling of the shoulder and of the thigh. The next day, when the patient was first seen by the author, the eye was phlegmamous, necessitating enucleation upon the following day. Examination showed that there seemed to be a fistula through the shrunken cornea from which pus could be squeezed. The globe was filled with pus that contained streptococci. The day following the operation her temperature fell to 36.8° C. The orbital tissues healed kindly,

In conclusion, Valude states that although at first sight the case seemed to have been one of endogenous infection, yet he is disposed to attribute it to ectogenous infection, germs having entered the organ by way of the diseased cornea.

A Case of Xanthopsia.

KOENIGSHOFFER, Stuttgart. (*La Clinique Ophtalmologique*, April 10, 1898.) Koenigshoeffer's case was that of a thirteen-year-old boy. The patient was treated for intestinal worms by the internal administration of santonin. Besides xanthopsia, vision was slightly reduced. Both symptoms disappeared with the ejection of the parasites.

A Case of Amblyopia Due to Intoxication by Sulphide of Carbon. Successfully Treated by Injections of Serum.

BORSCH, Paris. (*La Clinique Ophtalmologique*, April 1898.) The patient was a maker of balloons. When he first came to the clinic in February of 1897, he had a reduction of vision in each eye to one-twentieth of normal. The injections commenced in doses of from eighty to one hundred grammes daily. With the failure of vision a central and a peripheral scotoma for white, the latter being situated in the upper part of the field, were noted. Five days after the commencement of the treatment, vision in each eye rose to nearly one-eighth of normal, and the

scotomata had diminished in size. In five to six weeks' time, after twenty-five injections had been given, it was found that the patient's health was much improved and that vision in each eye had risen to almost one-third of normal, the scotomata being still further reduced in size. The injections were then stopped. Re-examination of vision several weeks later showed an acuity of about one-tenth in each eye, the scotomata being greatly reduced in area. Ten days later the patient was advised to change his occupation. He was not seen again for over six months' time, when it was found that vision with each eye had become normal and that the scotomata had disappeared.

The formula of the serum injected was as follows: Ten grammes of carbolic acid, twenty grammes of chloride of sodium, forty grammes of phosphate of sodium, eighty grammes of sulphate of sodium, and one thousand grammes of distilled water.

Intraocular Hemorrhage in Adolescents.

ABADIE, Paris. (*La Clinique Ophthalmologique*, May 10, 1898.) Abadie divides this type of hemorrhage into four groups, viz.:

- I. Sudden and recurrent hemorrhages.
- II. Dyscrasic hemorrhages.
- III. Hemorrhages caused by previous lesion of the deeper membranes of the eyes,
- IV. Apoplectiform hemorrhages.

The causes for the first group are all very much of the same kind, being quite common at or about puberty. For their prevention and removal they all demand the same line of general treatment. The second group can be first noticed along the retinal vessels themselves, and then they will be found aggregated in spots on the retina, extending later as masses into the vitreous humor. In these latter stages they may be mistaken for detachments of the retina. One point that serves to differentiate between the two conditions, however, is that reaction of the iris to light is always much more active in simple hemorrhage than it is in detachment of the retina. The author recommends the employment of the extract of cinchonia, combined with citric or sulphuric lemonade, perchloride of iron and er-

gotine or ergotinine, as the most efficient remedy in these cases.

The third grouping of cases which, as a rule, are secondary to chorioretinitis demand treatment by mercurials, this class of drugs being frequently combined with the treatment that is used with the second variety of cases. In this group local depletion is also of value.

The fourth variety which tends to destruction of the eye, is in Abadie's opinion due to excessive dilatation of the ocular vessels. This type is generally unilateral in character.

Researches Concerning the State of the General Arterial Tension in Cases Suffering from Glaucoma.

TERSON, A., and CAMPOS, M. (*Archives d'Ophthalmologie*, April, 1898.) The instrument used to measure the arterial tension in the following observations by Terson and Campos was the sphygmomanometre of Potain. The radial artery was the one employed, as previous observations in general medicine have been so frequently made with this artery as a standard. The normal tension with this instrument is from fifteen and one-half to sixteen. Four cases of hemorrhagic glaucoma were studied with the results as follows: The first had a tension of twenty-five; the second had one of twenty-one; while the other two cases which were albuminuric in type had respectively tensions of nineteen, and from twenty-five to thirty. It was found that general cachexia has a tendency to reduce intraocular tension. Thus in a fifth patient who was subject of hemorrhagic glaucoma with Bright's Disease the tension was but eighteen, this most certainly being due to the general condition. Five cases of acute glaucoma gave much lower tensions, viz., from sixteen to eighteen. Among fifteen cases of simple chronic glaucoma, twelve had a tension of from fifteen to seventeen (practically normal), two had a tension of eighteen, and one had a tension of from nineteen to twenty. Fifteen cases of sub-acute glaucoma gave very high results, eight ranging from twenty-four to twenty-six. The authors hope by these and more extended experiments to throw some light on the treatment of this disease. They believe that it is probable that in those forms that show high tension, the

hygienic regime that may be applicable to the existent conditions may prove of service.

**A Note on the Pathological Lesions of the Eye in
Secondary Glaucoma.**

AGABABOFF, Kazan, Russia. (*Archives d'Ophthalmologie*, April, 1898.) The eye upon which this very careful and extended study was made had been removed from a man seventy years of age. The patient had been struck in the affected eye some two years before by a branch of a tree, leaving the organ quite red in appearance. Vision soon began to disappear, and the eye, which at first was painless, at last became quite irritable and disturbing.

The following is in brief the result of the examination:

I. An arteriosclerosis in the chorioid.

II. An alteration of the pigmented epithelium over a limited surface and a hyperplasia with retrogressive changes; (a), diffuse thickenings that were visible to the naked eye, and (b), rounded formations which were disseminated in type and penetrated into the retina and deposited pigment in nearly all of its layers.

III. A series of retinal separations, these being pigmented and presenting in most part the appearances of secondary degenerative inflammatory reaction; simple senile cysts; hematoid cysts; hyaline degeneration of the retinal vessels; retinal and vitreal hemorrhages with those that had produced a connective tissue formation on the retinal surface and a proliferating and hyperplastic retinitis. There were also degenerated cells and other signs of inflammation in the ciliary body.

IV. A diminution of the vitreous humor which contained globules of blood that had come from an inflamed iris and ciliary body.

The cornea and the sclerotic presented the usual pressure-changes of glaucoma.

ABSTRACTS FROM RECENT GERMAN OPTHALMIC LITERATURE.

Quarter Ending July 1st, 1898.

BY

H. V. WÜRDEMAN, M. D.,

OF

MILWAUKEE, WIS.

[Luxatio Bulbi.

ROTHENPIELER. (*Beitr. z. Augenhkde.*, XXXI, April, 1898.) After an exhaustive review of the literature on the subject and some original research deduces the following conclusions: Many varied opinions have been expressed from remote to the present time regarding displacement of the eye bulb from its usual position. They all, however, have one thing in common, in only considering a displacement toward the anterior opening of the orbital cavity. Concerning displacement in other directions than the anterior, we find nothing in literature except the common dislocatio-bulbi. Only in recent literature do we find the term Luxatio-bulbi applied to posterior displacement. The term exophthalmos and enophthalmos so often found in literature have only one significance, in that they describe symptoms of a diseased condition. Definitions for forward dislocation of eye bulb do not correspond in the meaning they are intended to convey. Many of similar wording convey different conditions. An exact resumé of the ideas conveyed in these definitions cannot be made, while in the course of years, through additions and subtractions, a much too complicated disease calender has accumulated. Names for displacement of eye bulb have been derived from causative factors, also degree of displacement; sometimes both are used in the definition. Others again, only give heed to the mode and rapidity of the displacement in deriving a name for the condition.

No concise term for eye bulb displacement exists and, therefore, an exact term to cover all conditions is called for. The position taken by some, of considering the eye bulb and the cavity with its accompanying soft parts as a ball and socket joint, has a physiologic foundation, and gives us the only method by means of which we can form concise ideas of eye bulb displacements. Taking this view, every displacement must be considered a luxation as long as the eye bulb is still in connection with the soft parts of the eye cavity. When it is no longer connected to surrounding soft tissue, we speak of it as *Evulsio Bulbi*—tearing out of the eye.

Considering the origin, *Luxatio Bulbi* is: (a), Congenital, present at birth; (b), traumatic, through external force; (c), destructive luxation, destruction of supports of eye not due to injury.

As to degree, *Luxatio Bulbi* is, (a), total, in which the eye bulb is no more in contact with walls of eye cavity; (b), partial, in which parts of the eyeball are still in contact with walls of eye cavity.

As to direction, *Luxation Bulbi* is, (a), facial, eye bulb has moved forward toward nose, cheek, forehead; it leaves eye cavity through anterior opening; (b), obiecta, eye bulb has broken through bony walls of eye cavity and lies within the cavities of the facial bones or skull or within the cranial cavity.

Traumatic facial luxatio bulbi is caused from forward force or posterior pressure. *Luxatio bulbi traumatica obiecta* arises from direct injury to the eyeball with formation of spaces in the tissues.

The prognosis of luxatio bulbi traumatica is not altogether bad; if the optic nerve and eye membranes are not torn, it can be replaced and *restitutio ad integrum* follow. If the nerve is injured or eyeball broken, sight is lost. Bleeding into the eyeball may be followed by great loss of vision. Injuries to the muscles may leave squint.

Treatment is in reposition to protect the cornea and relieve pressure on the eyeball. For reduction it may be necessary to do canthotomy or puncture the edematous tissues. If impossible to replace the eyeball, or if much injured, enucleation may have to be done.

A complete bibliography is appended.

H. V. W.

The Lessening of Myopia Through Removal of the Crystalline Lens.

HIRSCHBERG. (*Centralbl. f. prakt. Augenheilkde.*, March, 1897.) The difference in refraction before and after operation for myopia depends upon the grade, and is not the same for all eyes. By increase of visual axis of 1 mm. in the myopic eye the refraction is improved 3 D. In the aphakic eye only about $1\frac{1}{2}$ D. The emmetropic eye becomes 10 D. hyperopic, after removal of the lens. To obtain the correction for distance of a myopic eye after operation, deduct one-half the amount of the correction of the myopia before operation, from plus 10 D. If the myopia is greater than 20 D., concave glasses for distance are necessary after the operation, and *vice versa*.

H. V. W.

Fuch's Protective Wire Mask for After-treatment of Cataract Operations.

PRAUN, E., (*Centralbl. f. prakt. Augenheilkde.*, March, 1898,) has used Fuchs' protective mask after cataract extraction with satisfaction. F. first described this in *Wien. Klin. Woch.*, 1893. It is made of stiff wire to cover one eye only at a time over which a flannel bandage is rolled. Bands extend from either side by which it is held in position. The edges of the wire protective are bound with heavy flannel.

Fuchs claims the following advantages for this wire mask. 1. It is much lighter, and especially in summer, less hot than the ordinary monocular bandage. 2. It protects the eye better from the hand of the patient. 3. It prevents pressure upon the eyeball. Lastly, there is less liability to opening of the wound. Hjort is the only author that thinks such not necessary to the welfare of the case, as he leaves the eye without bandage or protection of any description. Wolff's paper protection is much better.

H. V. W.

Visual Acuity Before and After Removal of the Lens in High Myopia.

LEBER, TH., (*Archiv. f. Ophth.*, XLIII, p. 218-251,) remarks that bettering visual acuity is not synonymous with bettering visual appreciation; which is ability of the eyes to see two retinal pictures separated; this naturally can-

not be measured. Corrected visual acuity is obtained by correcting lenses; true visual acuity is that of the natural eye. Under certain conditions different results are obtained in the same eye.

The size of the retinal pictures, in uncorrected myopic eyes seen at the far point, increases with the grade of myopia, as the retina always moves farther away from the focal point in elongation of the axis of the eye, notwithstanding high myopic eyes show no better visual acuity than emmetropic eyes, because the visual acuity is lowered due undoubtedly to damage to the perceptive elements caused by stretching of the retina.

The distance that the correcting lens is from the eye is very important, when the same grade of myopia is corrected by concave lenses of different focal distance, which are found at different distances from the eye, the retinal picture is smaller the farther the lens is from the eye. The retinal pictures seen in the distance are larger after operation, in the myopic eye which has become nearly emmetropic, than those seen before the operation with correcting lenses. Upon this depends part of the bettering of the vision in myopic lens extraction. The statement that the aphakic eye contains brighter retinal pictures than the myopic, as shown by Leber, is not quite correct. Part of the improvement in the visual acuity is due to influence on the retina and not to improvement of the optical conditions.

H. V. W.

Choroidal Sarcoma Accompanying Phthisis of the Eyeball and the Significance of Injuries Complicating These Growths.

LEBER and KRAHNSTÖRER, (*Archiv. f. Ophth.*, XLV, 1 and 2,) present a most thorough study of this condition in a 145 pp. article published in two numbers of the *Archives*. They have brought together a large number of cases in which choroidal sarcoma has developed from a hitherto phthisic eyeball. They hold the original wounding, as little as the inflammation, to be the direct cause of the new growth, but rather the original predisposition to tumor growth. Traumatic cases are placed by the author as less than 10 per cent. They report twenty-two cases of phthisis bulbi which existed before the tumor formation in which between the beginning of the phthisis and the for-

mation of the tumor there was a considerable period of time during which the eyes were free from inflammation. Thirty-four cases are reported in which choroidal sarcoma had a traumatic history. Thirty-two cases of secondary phthisis bulbi are reported in which the phthisis began after the development of choroidal sarcoma. The article is illustrated by one plate and replete with references to the literature.

H. V. W.

Experiments Upon the Pathology of the Pupillary Diameter and Centripital Fibers.

SCHIRMER. (*Archiv. f. Ophth.*, XLIV, 2.) The subject is so large that only a summary of the important conclusions arrived at can be here given: 1. The pupillary fibers are, in their entire course in the retina, separate and independent structures from the visual fibers. 2. The pupillary fibers do not end in the rod and cone layer, but in the inner retinal layer; their end organs are probably the cells called by Kolliker "parareticulare" and by Greeff "amakrine." 3. The larger part of the pupillary fibers end in the macula and its neighborhood, a sufficient number come from the periphery in order to make the release of the pupillary reflexes possible and make the pupil smaller. 4. In the optic nerve trunk the fibers seem to pass next to the visual fibers belonging to the same retinal group. 5. The physiologic pupil diameter does not result from elastic stretching of the iris, but reflected sphincter contraction. 6. The pupillary fibers have much better protection in the optic nerve, from mechanical pressure, than the visual fibers, but the opposite is true of inflammatory process, be they retro- or intra-bulbar. The size of the pupil is a diagnostic help in the differentiation of retro-bulbar compression and retro-bulbar inflammation. 7. The pupillary fibers are affected in diseases of the retina only when they are extensive enough to involve the inner retinal fibers. High grades of destruction are usually limited to the outer layers and do not interfere with the pupillary fibers. 8. Extensive diseases of the choroid, when involving the retina, only affect the pupillary fibers. 9. Hysteric, congenital and squint amblyopias do not affect the pupillary fibers.

H. V. W.

Detached Retina.

HORSTMANN, (*Archiv. f. Augenhkde.*, XXIV,) gives the results of his observations on 35 cases of detached retina. In 5 of his cases there was complete recovery of sight, in 2 the retina preserved its normal position, but was functionally imperfect; in 2 cases the retina returned to its normal position, but only for a short time. In 11 cases there was partial detachment, and in 15 complete detachment. After a careful examination of his cases he comes to the conclusion that every case of spontaneous detachment is, in the first instance, due to disease of the uveal tract. It appears that a shrinking of the hyaloid membrane takes place, caused by transudation of fluid from the blood vessels. The fluid is not driven into the substance of the retina, but passes between the choroid and retina; in this manner a detachment of the retina is produced. If the detachment is large, the raised part will probably tear, and the torn portion can only regain its normal position where the shrinking of the hyaloid membrane has developed to a definite extent. The slow process of transudation retards the shrinking of the hyaloid membrane, and consequently the replacement of the torn retina. The diminished tension of the eyeball, which is frequently met with in large retinal detachments, is an argument in favor of the lessened volume of the hyaloid membrane. Spontaneous cures in cases of retinal detachment, with return of the visual powers, were only observed in cases in which the detached portion had not completely lost the perception of light, and in which the subretinal exudate had not become absorbed; in these cases, also, the detached portion was not torn, nor was there any alteration in the ocular tension. Instances also occurred in which the detached portion resumed its normal condition, but remained functionless; the subretinal exudate had become absorbed in these cases, but there was no diminution in ocular tension, nor any torn portion of retina to be observed. If a torn retina is associated with a minus tension, the prognosis is very bad. All operative procedure is useless; the least harmful, perhaps, is tapping the subretinal exudate by scleral puncture. A few cases have been recorded in which replacement took

place after this procedure. All methods are to be depreciated which cause any injury to the retina or ciliary body.

H. V. W.

Sympathetic Papillitis.

MULDER, (*Klin. Monatsbl. f. Augenheilkde.*, December, 1897,) reports a case of this uncommon affection. E. M., aged 15, a shoemaker, received an injury to the right eye with a piece of cartridge case while shooting. The injured eye is said to have become blind soon after, and was for a long time very painful. After three months treatment it quieted down, but the patient has since frequently had headache affecting the left half of the head, at times so badly that he has had to keep his bed for a week or two. Neither eye was painful. On May 4, 1896, the patient noticed that the sight of the left eye was worse, and soon he was unable to carry on his work. On June 2, he came under Mulder's care, who noted as follows: The injured eye of abnormal size; by focal illumination a small scar, visible in the otherwise clear cornea, probably indicating where the foreign body entered; anterior chamber of normal depth; iris slightly discolored; pupil small and bound down by posterior synechia; behind the pupil the thickened lens capsule could be seen; no perception of light; tension normal; the globe only slightly sensitive to pressure, but on this occasion some pericorneal injection. The left eye normal in appearance; no pain; corneal injection; pupil reaction normal; vision 6/24. The optic disc showed the appearances of a moderate papillitis; veins somewhat enlarged and tortuous, the contour of the papilla being veiled, one small retinal hemorrhage near the disc. Field of vision normal; slight impairment of color perception in center of field. Vitreous and choroid quite normal. No albumen or sugar in urine. The diagnosis was made of sympathetic papillitis, and on June 4, the right eye was enucleated. Examination showed total detachment of the retina, and in the ciliary region an encapsulated piece of copper. After the operation the headache entirely disappeared. No internal medicines were given, in order to see whether the symptom of papillitis would spontaneously disappear. June 11, vision 6/12, swelling of the papilla and blood vessels less. June 16, vision

6/9; color vision quite normal. July 4, vision 6/6. The disc has the normal appearance and only a trace of the small hemorrhage remains. The patient was dismissed, cured, and in November the eye had remained all right, and there had been no headache.

H. V. W.

The Yellow Oxide of Mercury Ointment.

PAGENSTECHER, H. (*Klin. Monatsbl. f. Augenheilkde.*, March, 1898.) The yellow oxide of mercury ointment was first used for the eye by Alex. Pagenstecher in 1856. This salve was first a finely divided mixture of the red precipitate in eight parts of fresh butter. On account of the difficult subdivision of the red precipitate, P. was advised by Apothecary Hoffmann, of Wiesbaden, to make a wet mixture of the oxide. The salve is a mechanical mixture of the yellow oxid and the excipient and, therefore, the particles of mercuric oxid must be ground very fine. This is to be determined by examination of a very thin layer of the salve spread upon a glass plate and looked at with a loupe. In case of insufficient trituration, large and small lumps of the drug will be found, which appear red or yellow. Another test, is to spread a very thin layer upon thin white paper and hold it up to the light, looking at it with a magnifier. If small particles of oxid are found, the salve has been improperly prepared. Under the microscope with 350 to 400 X a regular subdivision of small amorphous particles of the precipitate are to be found. Hoffmann gives the following directions: To make the yellow oxid of mercury, a solution of bichlorid of mercury is mixed with a solution of caustic potash. The precipitate is washed with distilled water and kept from the light until no trace of chlorin remains. It is then dried in moderate heat and protected from the light. The desired quantity is rubbed up in a porcelain mortar, and then mixed with the vehicle, which must be free from water. This will not become rancid and, if kept from sunlight and dampness, will remain unchanged for years. In tractable cases he uses even a strong concentration of 10 per cent. The indications are, all forms of pustular conjunctivitis and their results, corneal diseases, eczema of the lids, etc.

H. V. W.

Protargol in Eye Diseases.

PERGENS, Brussels. (*Klin. Monatsbl. f. Augenhkde.*, April, 1898,) found that protargol did not irritate his own healthy eyes and in this respect was preferable to argonin. In most cases he used a 2 per cent. solution, often 5 per cent., and in dacriocystitis and blenorrhea 10 per cent. In catarrhal conjunctivitis he dropped the solution in the eye six times a day; in lighter cases three times. In blenorrhea neonatorum 12 per cent. solution is used every hour, and the healing occurs in six to thirteen days. In five cases of lacrimal suppuration, the injection of a 10 per cent. solution cured four cases in ten to twenty-two days. In the fifth case there was a relapse. In chronic blenorrhea of conjunctiva, the results are less favorable.

H. V. W.

Spontaneous Resorption of Senile Cataract.

NATANSON, Moscow, (*Klin. Monatsbl. f. Augenhkde.*, April, 1898,) has observed three cases of disappearance of opaque lens substance within the closed macroscopically intact capsule. This spontaneous resorption of cataract is a hitherto but little known late stage or rather a termination of the retrogressive metamorphosis of senile cataract. This resorption occurred in the cases described, always under the clinical appearances of Morgagnian cataract. In the course of time the opaque and fluid detritus of the lens, in which the nucleus floated free, became again transparent, through which factor the sight was restored. Later, the contents of the capsular sac were absorbed and sometimes the nucleus. The cases showed that resorption of senile cataract took ten to twelve years.

H. V. W.

Conjunctival Tuberculosis with the Appearances of Trachoma.

HEINERSDORFF, H., (*Klin. Monatsbl. f. Augenhkde.*, June, 1898,) remarks that conjunctival tuberculosis has been known to resemble trachoma and describes the case of a girl aged 17, who in childhood had scrofulous eye inflammation, from which she recovered. In May, 1896, she came to Schoeler's eye clinic with granular conjunctivitis on both sides, swelling of the follicles and keratitis pan-nosa. Was treated by expression of the granules and af-

thoward by bluestone. Under this treatment the left eye decidedly improved, but the right did not, except that pannus was cured. In May, 1897, the patient returned. The right eye was deeply buried in a muco-purulent discharge. The aperture of the eyelids was less open than the left. In looking upward, the upper lid remained down and was thickened. The palpebral conjunctiva was much injected, the under fold was shortened through cicatricial bands and covered with millet seed-sized gray translucent granules. The bulbar conjunctiva in the lower part was likewise covered over with flat granules, which had invaded the cornea at the temporal edge. The upper retrotarsal fold was even more invaded and the scleral conjunctiva was covered with the masses. Vision was $1/3$. The left eye was in much the same condition, except there were thick spots on the cornea. Vision $1/10$. At the examination a small amount of tissue was taken from the right eye for microscopic examination, and showed epithelial nests enclosing many wandering cells. Diagnosis of tuberculosis was made, although it was impossible to find tubercular bacilli by any method in the excised portion. A fresh piece of tissue was inoculated into anterior chamber of eye of rabbit eight weeks later, it being entirely resorbed, the eye remaining without reaction. About four months later a flesh colored lump formed between the wound and the iris, involving the cornea and later the iris, which broke down and formed an abscess in the cornea. No bacilli were found in this inoculated animal.

H. V. W.

Treatment of Trachoma by Keining's Method of Massage with Sublimat Solution.

BERGEL, Inowrezlaw, (*Woch. f. Th. and Hyg. des Auges.*, April, 1898,) recommends that chronic cases be treated with rubbing into the everted conjunctiva 1:3000 or 1:2000 corrosive sublimat solution for one-half to one minute applied by hard rolled cotton pledgets. He has even used 1 per cent. solution without damage. The intensity and length of the massage depend upon the grade of hyperemia and amount of swelling in the conjunctiva as well as the number, size and roughness of the follicles. The more vascular the membrane and the harder the follicles, the stronger should be the rubbing; the greater the

swelling and loosening, the more superficial the operation. Cocain may be used. In acute cases he uses ice compresses, silver, etc., and in chronic cases supplements the above method by mechanical expression with Knapp's roller forceps, bluestone, etc. He has used sublimat massage in follicular catarrh with good results. H. V. W.

Blindness in Spain.

HIRSCHBERG, (*Woch. f. Th. and Hyg. des Auges.*, May, 1898, in the *Berl. ophth. Ges.*, May 12, 1898,) said that the streets of the large cities in Spain are full of blind beggars, not only the best business streets, but also the best residence streets. The principal cause of blindness is trachoma, then follows blenorrhea neonatorum and small-pox. While there are nine blind to 10,000 inhabitants in Germany, in Spain, there are 14.8 to 10,000. In the north of Spain there is but little trachoma. In Madrid 80 per cent., and the farther south the greater is the percentage.

H. V. W.

The Yellow Salve.

FUCHS, R., Mönnheim, (*Woch. f. Th. and Hyg. des Auges.*, May 26, 1898,) claims a fact which is well known, that the ordinary method used by apothecaries in preparation of the commonly used ointment, by mixing hydrarg. oxid with vaselin upon a glass plate or rubbing it up in a mortar is an ineligible method, which leaves many large irritating particles of the chemical. The recommendation of Pagenstecher that the salve be made in a large manufacturing house in a 10 per cent. mixture and sent thence to the various apothecaries who could readily dilute it to the required percentage is not feasible on account of the cost. Five gms. of the oxid is rubbed up with equal parts of white American vaselin in a mortar and put in a steam bath with moderate heat and gradually rubbed. The rubbing is continued twenty to twenty-five minutes and 15 gms. vaselin are added, and then taken away from the steam bath and the mixture rubbed until cold. By this, results a salve of 5.0:20.0, which may be readily diluted to the required percentage by addition of more vaselin and mixing upon a glass plate. By the use of heat more complete subdivision of the chemicals is assured. He claims that the microscopic test 250 X shows a much

finer subdivision of the drug than is obtained by the Wiesbaden method.

H. V. W.

Modification of Simple Cataract Extraction.

ANGELUCCI, A., (*Die Ophth. Klinik.*, No. 6, 1898,) considers that iridectomy in cataract extraction is a disadvantage under all circumstances. The blepharostats and cystotome are unnecessary; he operates only with fixation forceps and small knife and according to a method with which he has been very fortunate. The following points are dwelt upon by the author: 1. After thorough disinfection of the field of operation and instruments and complete cocaineization of the eye, the patient is directed to look downward as far as possible. The upper lid is raised to the margin of the orbit with the thumb of the right hand, during which the left hand holds the fixation forceps whose branches are somewhat wide and have somewhat coarse teeth. These clasp the conjunctiva in the upper portion over the region of the superior rectus 4 to 5 mm. from the corneal edge and so deeply that the tendon is included. 2. The right hand lets go of the upper lid whose free edge is then held back by the sides of the forceps by which the eyeball may also be pulled forward or downward if necessary, and by which it is also entirely immobilized. The puncture and counter-puncture are made at the sclero-corneal junction, generally a little into the clear edge, and a flap is made which includes a little more than a third of the corneal circumference. The capsule is opened with the point of the knife in the passage of the knife over the pupil (in the case of hard cataracts with normal capsule) without turning the knife. The operator endeavors to cut through the cornea as quickly as possible, using considerable force, without sawing motions, as by these the iris may be injured. 3. The forceps remain in place and the lens is removed by pressure upon the cornea with Daviel's spoon, the force being directed from below upward by slight movements, which applied in this direction remove the principal parts of the cataractous masses. Then when necessary, the iris is replaced and the forceps removed.

The advantages claimed by the author for this method are as follows: 1. The possibility of pulling the eye for-

ward by the fixation forceps is of especial value in senile exophthalmos. 2. The cut is more easily and comfortably made on account of the fixation being near the flap, the eye being much better held still, as it is fixed by both the forceps and the knife. The resistance of the tissues is less felt by the operator the nearer the cut is to the vertex of the flap; when the eye is fixed downward the opposite occurs, as the cornea flattens and the bulb is pushed backward into the orbit. 3. A further advantage of fixing the eye above lies in the fact that during the extraction dangerous pressure is much lessened; thus by this method injury or prolapse of the iris is lessened. 4. Usually the iris goes into place spontaneously after the extrusion of the cataract, on account of the fact that the forceps holds the wound open and aids reposition of the iris, accordingly prolapse of the vitreous is lessened. 5. Removal of the cataract is regulated by pressure between the spoon and the forceps. 6. Lastly, this method renders the service of an assistant unnecessary.

H. V. W.

Demonstration of Binocular Color Combination.

SCHENCK. (*Die Ophth. Klinik*, April 20, 1898; Medico-Physical Society of Würzburg.) Binocular color combination is easily demonstrated in anyone, even those unaccustomed to physiologic optics. Through the methods ordinarily used such unreliable results were obtained that many authors, among them von Helmholtz, disputed the possibility of binocular color mixing. S. uses for the demonstration the several colored postage stamps. These show white markings upon a colored ground. In the middle is the escutcheon and over it the word "Bayern" and under it "Pfennig." In each corner is found the number in a round background, the value of the stamp. The measurements and details of all the stamps are the same, with the exception of the corner figures. The latter may be blotted out with black. The stamps are so placed that one color is seen with one eye and another with the other, with the help of the stereoscope; then only one stamp is seen in the combination color. The red 10-pfennig stamp and the green 5-P. stamp by daylight are nearly complementary colors. Their combination seems to be a neutral dark gray. The blue 20-P. stamp and the orange 25-P.

stamp, lighted by yellow lamp light, are almost complimentary, by daylight the blue preponderates.

The reason why these stamps are especially helpful for the demonstration is, that they have considerable detail and have exactly the same dimensions. These details are combined, and with this there is binocular color combination.

H. V. W.

Practical Treatment of Keratomalacia in Infants.

KUTHE. (*Ophthalm. Klinik*, March 5, 1898; Berlin Ophthalmological Society,) has seen within four and a half years, from 34,000 cases in Hirschberg's clinic, 26 cases of keratomalacia. The treatment comprises that of the general condition; daily applications of collodion-cotton dressings and physiologic salt solution. The collodion bandage is recommended, as it remains perfectly in apposition with the eye and prevents too quick evaporation of the dressing. A considerable number of cases heal with entire closure of the pupil which should be operated upon early, in order to prevent increase of intraocular pressure and to make a visual opening, which favors development of the retina. Canthotomy is to be done before the intraocular operation. He showed a case which had been under treatment.

H. V. W.

Effects of Mydriatics and Myotics.

SPIRO. (*Ophthalm. Klinik*, March 5, 1898; Berlin Ophthalmological Society.) Examination into the clinical aspect of the effects of mydriatics and myotics is accompanied with difficulties on account of the great differences of opinion in regard to the anatomy and physiologic basis. S. compares the latest reports upon the structure of the ciliary ganglion and alludes to the recent report of Schulz in the Berlin Ophthalmological Society, concerning his experimental and physiological studies. At the request of Hirschberg, S. had systematically proved the work of Schulz regarding the effect of atropin and eserine in this clinic. He experimented upon twelve cases of total paralysis of the oculo-motor nerve, in which paralysis of the pupil and accommodation was complete. The paralysis was mostly of recent origin. A few cases dated back as far as six years. In these, atropin widened the enlarged pupil from 1 to 1½ mm. S. does not think that this means

irritation of the sympathetic, but further paralysis of the not yet fully paralyzed nerve ends, as ascribed by Schulz. Eserin causes maximum contraction of the pupil after ten minutes. This completely contradicts the views formerly held regarding effect upon the cerebrum. Whether eserine, as has recently been shown by Schulz, acts exactly opposite to atropin upon the nerve ends or affects the sphincter could not be explained by these clinical experiments. It is of interest that in old cases of complete pupil paralysis, light caused some further contraction of the pupil. In these experiments one drop of a freshly prepared 1 per cent. solution of atropin or one drop of a $\frac{2}{3}$ per cent. solution of eserine salicylate was used. Further clinical experiments upon this subject are now going on in Hirschberg's clinic.

H. V. W.

Loss of Vision After Pneumonia.

HAMBURGER, (*Ophth. Klinik*, March 15, 1898; Berlin Ophthalmological Society,) showed a case from Hirschberg's clinic of a 20-year-old man who had previously been healthy who lost vision after inflammation of the lungs. The left eye after a few weeks became entirely blind and the right lost considerable vision in a few months. Examination showed that there was atrophy of the optic nerve in the left eye and in the right, choked disc, with defect of the lateral visual field immediately under the fixation point. Diagnosis was made of tumor of the optic chiasm, with entire destruction of the left nerve and interruption of some of the nerve bundles of the right, which proceeded to the center of the right retina. The lateral nerve fibers of the right optic nerve remained intact.

H. V. W.

Upon the Ciliary Ganglion and the Center for the Pupillary Reaction.

BACH. (*Ophth. Klinik*, March 5, 1898, Würzburg Medico-Physical Soc.) The author gave a short critical review of the previous experiments upon the nature and function of the ciliary ganglion. From these and from his own experiments upon the normal ganglion of cats, monkeys and rabbits, and from experimental results after exenteration of the bulb with more or less complete destruction of the

sensory nerves of the cornea, he concluded that the ciliary ganglion is a sympathetic structure. The author spoke further concerning the results of researches upon the location of the reflex center of the pupil. He had decapitated monkeys, cats and albinotic rabbits and concluded that after an ordinary decapitation, even when done pretty high up, both direct as well as indirect pupillary reaction remains. By this there is always left a cervical portion of the spinal cord. If this portion be destroyed with a knife, immediately after the decapitation, then pupillary reaction is lost. From this experiment he concludes that the reflex center of the pupil is in the upper part of the cervical portion of the spinal cord. H. V. W.

Pupillary Paralysis in Carcinoma Affecting Spinal Cord.

WOLFF. (*Ophth. Klinik*, Würzburg Medico-Physical Soc.) In the case of a paralytic there were objective symptoms of pupillary paralysis, the posterior columns of the spinal cord as low down as the third or fourth cervical vertebra were found to be destroyed. This patient died of carcinoma, which had affected the lower part of the spinal cord. In examination of a number of cases of paralysis and tabes W. found that where there was pupillary paralysis there were changes of the cervical portion of the cord, and that where there was no pupillary paralysis no changes were found in this part. H. V. W.

Exudation Into the Ciliary Body After Injury.

BERGMANN (*Die Ophth. Klinik*, March 5, 1898, *Med. Ass'n of Nurnberg*,) showed a case from v. Forster's ophthalmic institute in which the sclera and ciliary body of the right eye had been perforated by a splinter of steel. The wound was at the junction of the cornea and sclera, and both aqueous and vitreous were lost. On the third day after the injury, by illumination, there could be seen a new formation of the size of a bean, which had a silvery shining surface and proceeded from the ciliary body and the wound. This prominence, without any other ophthalmoscopic changes in the course of 10 weeks, was half absorbed and without the occurrence of vitreous opacities or inflammatory symptoms. The tension was reduced for a week and then became normal. The visual field for

white and color was physiologic. The visual acuity after correction was 5/X. For the differential diagnosis of such pathologic changes he shows that the clinical course allows us to differentiate with certainty: 1. Purely the wound; 2, tumors; 3, true or false cysts; 4, exudations without membranous coverings. The clinical picture is that of an active displacement from its base of the pars ciliaris retinæ, which is an exudate from the ciliary body under its epithelial covering, whose protracted course is furthered through the free end of a ciliary process being included within the exudate.

H. V. W.

Retinitis Proliferans.

MAKLAKOW (*Die Ophth. Klinik*, March 20, 1898, *Moscow Ophth. Soc.*,) showed a case of retinitis proliferans in a patient 44 years of age, who had noticed loss of vision on the right eye for 20 years, while the left remained healthy. About four years ago the vision of the left eye began to decrease in much the same manner as that of the right. Externally nothing abnormal. Ophthalmoscopic examination: Right papilla whitish, the outer portion covered over with a bluish white mass, which projects into the vitreous. From this mass a white string proceeds, which is connected to the periphery of the retina. In the periphery of the choroid there are atrophic plaques. These masses float about in the vitreous body, and the entire nerve-head can be observed through them. They cover the outer portion of the papilla and project somewhat into the vitreous, and consist of newly formed connective tissue but no blood vessels. On the left side there was a neuritis, with bleeding into the nerve-head. The formation of new tissue in the vitreous was supposed to have occurred from bleeding of the retina following neuritis. This was the most likely diagnosis as in the second eye a neuritis with hemorrhages was observed.

H. V. W.

The Ocular Symptoms of Hysteria and Nervousness in Children.

SAENGER (*Die Ophth. Klinik*, March 10, 1898, Medical Society of Hamburg,) spoke upon hysteria and nervousness in children, in which he laid stress upon the ocular symptoms and their relation to functional nervous dis-

turbances. He distinguished three groups of nervous disease; in children, and in all found certain symptoms of the organ of vision.

1. Neurasthenia.—Out of 30,759 cases of eye disease from the polyclinic there were 1,029 children with nervous asthenopia which is not often recognized and often remains the principal symptom. Conjunctival or accommodative asthenopia has nothing to do with this. It does not come from central origin, but may be more often referred to retinal causes which are connected with a deficient nutrition and lessening of the visual substance as has been shown by Wilbrand.

2. Hysteria.—Blepharospasm of long duration without appreciable eye affection may occur in this condition, which may sometimes show as a form of ptosis. Hysteric ptosis is common enough, but hysteric amaurosis is less common.

3. The combination of neurasthenia and hysteric conditions.—In children this group shows itself ordinarily in connection with phthophobia and a weakness of the eye for near point, pain in the eye, etc., diminished visual acuity and concentric contractions of the field of vision; also a neurasthenia of the eye, which Michel has called hysteric stigmata. The causes of these symptoms in children between 10 and 14 years of age are seen by S. to be in too much forcing work at school, poor hygienic surroundings, in anemic children of the poorer classes. These ocular symptoms are plain, as the eye is one of the first organs affected.

H. V. W.

Pulsating Exophthalmos.

BESELIN (*Die Ophth. Klinik*, March 20, 1898, Med. Soc. of Hamburg,) showed the case of a 58-year-old man with pulsating exophthalmos, which had arisen two months before from a fall on the head, which was attended by loss of consciousness and bleeding of the nose and right ear. The cause was an injury to the internal carotid within the cavernous sinus, from a splinter of bone. Through this an arterio-venous aneurism developed, which continued into the ophthalmic veins within the orbit. A rushing sound, with pulsation in the left ear, could be heard on the left side of the skull. The eye protruded 1.5 cm.

There was paralysis of the levator and the outer eye muscles, caused by pressure upon the nerves and diminishment of sensation in the region supplied by the trigeminous; enlargement of the conjunctival and retinal veins; moderate diminishment of the visual acuity. By treatment after three weeks, 6 hours a day, of compression applied to the common carotid, there was improvement of the trouble and cessation of the exophthalmos.

H. V. W. ✓

Two Cases of Ciliary Nerve Resection, with Preservation of the Optic Nerves.

FICK (*Die Ophth. Klinik*, May 5, 1898, Zurich Soc. of Physicians,) had tried this procedure in order to influence the healing of bad cyclitis. In the first case the eye was rendered free from pain in eight days after the operation, and in one week was no longer inflamed; the greatly reduced vision was improved in a couple of months and eventually raised to what it was before the beginning of the inflammation. In the second case F. made this operation twice, the first being insufficient, the greater part of the cornea retaining its sensibility. The result of the first operation upon the inflammation was incomplete; the eye was paler than before, but did not become white, and gradually lost vision. A second ciliary nerve section had the hoped-for results referable to the inflammation, but was fated, on account of severe bleeding, to be blind for three days and to have exophthalmos. On the fourth day sensation of light and two weeks later good vision came back, but the final result was optic nerve atrophy, with visual acuteness only 2/XXXVI and contraction of the visual field. He will in the future perform Krönlein's temporary resection of the orbital wall. He hoped by this to render the posterior hemisphere of the eye so free that all structures that might be cut would come into view and bleeding readily stopped before any noteworthy damage occurred.

H. V. W. ✓

Loss of Vision Through Lead Poisoning.

ELSCHNIG. (*Die Ophth. Klinik*, May 5, 1898, Vienna Soc. of Physicians.) It is remarkable that relatively little is known of the ocular symptoms caused by lead poisoning.

The changes have only been observed in chronic cases and most seldom in the muscles. There are only 16 cases of uni- or bilateral ocular muscle paralysis described in all the literature. The prognosis is somewhat unfavorable. In two cases the paralysis persisted and in one irritation of the sympathetic. Isolated sphincter paralysis, with or without complication of the accommodation, has been observed. In Redlich's case there was pupillary paralysis and on post-mortem sclerosis of the posterior spinal column was observed.

The affections of vision are of much greater interest, the appearance being changeable and not pathognomonic. Schroeder collected 55 cases of saturnine amblyopia, which is an early symptom. The amaurosis was accompanied by interstitial nephritis, and the two affections may be ascribed to the same cause. No special portion of the visual pathway seems to be exempt, which explains the many varieties of the disease. Retinitis and intraocular neuritis of all grades appear. In simultaneous encephalopathia saturnina the clinical aspects of a brain tumor may be simulated. This was the case in one of the author's patients in which bitemporal hemianopsia occurred, like in the case described by Westphal. In another case there was great serous exudation in the papilla, accompanied by remarkable thickening of the vessel walls. The result is usually neuritic atrophy. Only in very mild cases, and in those which have no symptoms such as observed by Gowers, can there be any improvement.

Retrobulbar neuritis occurs next frequently and may begin as well with central scotoma as with peripheral contraction of the visual field. Ophthalmoscopic examination is negative at first; later the affected portion of the papilla becomes blanched. Only in recent cases the prognosis is relatively better than in alcoholic retrobulbar neuritis.

Saturnine amaurosis was known before the era of the ophthalmoscope. To this time there have been reported six cases of sudden and complete blindness which lasted for hours or days. The fundus was normal, the pupillary reaction remained; the cause was esteemed of reflex character. The question of peripheral causation may be raised, as in a case E. reported in which there was spastic schemia of the retina.

There is as yet no satisfactory explanation of the origin of lead intoxication. In muscle paralysis it is supposed to be upon the individual parts of the nerve tracts. Eichhorst compares all the probabilities by which damage to the vessels occurs. From the character of the ocular muscle paralysis in lead poisoning a lesion of the nerve stems may occur, which by Mannaberg and Pal has been demonstrated neuritis, and by von Chrostek to be a pressure paralysis caused from the edematous and swollen brain on the nerves at the base of the skull. Central affections, the isolated sphincter and accommodative paralysis, and also the rise of typical tabes dorsalis are to be explained by these effects of lead upon the base of the brain. It would be well to know what role the fluctuation in the caliber of the blood vessels and the blood pressure may play, as well as the consecutive inflammatory vessel changes. The principal site of the pathologic process in retrobulbar neuritis is to be found in the canalis opticus, the disease in the nerve bundles shuts up large arteries. Hemiplegic symptoms occur through spastic ischemia, which explains the negative fundus of Westphal in encephalopathic saturnina. Elschnig recommends massage of the eyeball, and in those cases where there is seeming improvement, paracentesis of the anterior chamber. H. V. W.

Acute Epidemics of Ophthalmia.

GREEFF (*Die Ophth. Klinik*, March 23, 1898, Berlin Med. Soc.,) is of the opinion that epidemics of eye diseases have been very much overrated as regards their danger. No year passes in which an alarm is not carried abroad that Egyptian ophthalmia is again spreading with the same terrible results as had been observed in the first part of the 19th century, at the time of the Napoleon wars. Accordingly the most strict rules are promulgated, nitrat of silver and blue stone taken up and the epidemic reduced without any evil results. The therapy, as has been reported to the government has proved brilliant. It is difficult, almost impossible, to find anyone who has been seriously threatened by this disease. Greeff may be esteemed an authority on these epidemics as he was government commissioner in Berlin and traveled for two years in the trachoma districts. That these acute epidemics have

nothing to do with trachoma can be said with safety, because they have been thoroughly studied both clinically and bacteriologically. The expression "contagious epidemic" is, accordingly, not always synonymous with trachoma, a practical and very important statement relative to the therapy.

These epidemics have been commonly described under the name of "contagious epidemics," but are nothing else than a congery of complex symptoms first described by A. v. Graefe, under the name of acute inflammatory catarrh (acuter Schwellungscatarrh). The course of this disease is favorable. It is quickly developed, and quickly disappears. It is accompanied by considerable swelling of the conjunctiva with moderate photophobia, and after two or three weeks, in case earlier healing has not been induced through proper treatment, the eye is again normal and uninjured. Such epidemics occur in people who are free from trachoma as well as in those who have that disease. They are clinically and etiologically to be separated from the ordinary Egyptian epidemic. As an example, Greeff quoted the high artillery schools which, in the previous year, in the course of three to four days the entire establishment had been affected, and in the same length of time had disappeared. From a bacteriologic standpoint, these acute epidemics may be divided into four groups: 1. *Pneumococcus conjunctivitis* (as described by the Institute Pasteur.) 2. *Conjunctivitis through diplococci*. 3. *Conjunctivitis through micro-organisms*. 4. *Conjunctivitis through strepto- or staphylococci*.

The clinical symptoms in all cases are the same. Great swelling, myosis, muco-purulent secretions and quick spreading in closed institutions and families. From these purely local epidemics there is another to be distinguished which spreads through entire countries, kingdoms and provinces. It is characterized by considerable enlargement of the follicles. This disease proceeds without irritation. The fact that it is often accidentally discovered, shows how little inconvenience it causes. It looks like follicular catarrh, and ordinarily causes neither redness nor swelling, nor subjective symptoms. These so-called epidemics are generally found in examination of schools and

seem to be entirely harmless. According to Greeff, 25 per cent. of all Berlin school children have this disease. One could at any time construe an epidemic.

The causes of this condition are not entirely determined. Bacteria cannot be excluded while its artificial propagation from person to person has not been accomplished. Probably generally poor hygienic conditions are the causes, which may account for the fact that the disease was found in schools and factories. Generally, the air is thick with exhalations and dust. This follicular swelling often occurs in children with the lymphatic diathesis, analogous to swelling of the lymphatic glands, and in chlorotic girls. A connection between follicular catarrh and trachoma in the sense that the disease may be merged one into another, cannot be true. It is likewise evident that in trachomatous regions follicular catarrh may become tracnomatous. Upon these facts G. bases a proposition that a difference should be made between follicular catarrh, in order to prevent unnecessary alarms.

H. V. W. ✓

Congenital Anomalies of the Cornea and Iris.

FILATOW, (*Die Ophth. Klinik*, May 5, 1898, Moscow Ophth. Soc.,) showed a case of congenital anomalies of the cornea and iris. These anomalies consist of: 1. Microcornea and flattening of the corneal surfaces; 2. Corneal opacity; 3. Ectopia of the pupil combined with myosis; 4. Persistent pupillary membrane attached to the posterior wall of the cornea. Both eyes show exactly the same anomalies. The diameter of the cornea is 10 mm. The small flattened out cornea is clear in the center, but on the periphery there is a snow-white ring of opacity about 2 mm. wide, somewhat similar in appearance to the limbus. From this there proceed fine white rays. Through the anterior chamber the surface of the iris and the pupil may be observed. The pupil is very small, reacts to light, and is of a vertical oval. The surface of the iris is uneven, and of different colors. On the outer portion of the iris there is a fine process which communicates by thin string-like structures with the iris. The inner portion of the iris is not visible. It is covered over by a three-cornered membrane whose wide base is obscured by opaque cornea,

and cannot be observed, but the point of which lies under the center of the clear cornea. The anterior surface of this membrane touches the posterior wall of the cornea, although the posterior surface is only connected with the iris in two places. From the point of this three-cornered membrane a fine string-like process proceeds outward, which passes under to the iris. H. V. W.

The Influence of Holocäin Upon Diffusion of Fluids from the Conjunctival Sac to the Anterior Chamber.

✓ SNEGUIREW, (*Die Ophth. Klinik*, May 5, 1898, Moscow Ophth. Soc.), had found by Bellarminoff's method that holocäin favorably influenced and increased diffusion from the conjunctival sac into the anterior chamber, and concluded that the combination of holocäin with atropin or eserin would produce more favorable results than when these drugs were combined with cocain. H. V. W.

Intraocular Hemorrhage After Saemisch's Operation.

✓ GOLOWINE, (*Die Ophth. Klinik*, May 5, 1898, Moscow Ophth. Soc.) In the case of a patient with ulcer serpens, in which there was hypopion half filling the anterior chamber, the author made a keratotomy, the cut being 4 mm. in diameter. The outflowing pus tore the iris. During this it appeared as if a round mass of the iris would be forced forward; the lens immediately came forward so that it was difficult to keep the edges of the lens from being injured during the operation. The bandage had to be changed one-half hour later, as it was entirely soaked with blood. In a couple of hours the bleeding stopped and the patient was enabled to leave the clinic in a few days. The little mass which came out of the eye was determined upon microscopic examination to be composed of the ocular membranes, the iris, choroid, etc. H. V. W.

Proliferating Retinitis.

✓ MAKLAKOW, (*Die Ophth. Klinik*, May 5, 1898, Moscow Ophth. Soc.), gave a short resumé of the literature and showed that for a diagnosis it was not necessary to prove the entire attachment of the newly formed membrane to the retina. Often the blood vessels are not to be observed and likewise the occurrence of choroiditis with proliferating retinitis in the same eye has often been described.

Blessig had seen the same case which M. described, and wrote that the choroiditis had been observed to develop within the last five years, that the newly formed tissue had become more translucent and its extent had lessened.

H. V. W.

**The Occurrence of Glaucoma in Eyes Without
Crystalline Lens.**

ST. BERNHEIMER, (*Wien. Klin. Woch.*, April 28, 1898.) Inasmuch as in the greater number of cases the development of glaucoma, associated with aphakic eyes, is to be considered secondary, it is clear that an uneventful healing after cataract operations is the most certain preventive of such secondary glaucoma. Especial attention should therefore be given to the hands of the operator, careful incision, complete reposition of the iris, careful cleaning of the wound, etc. In the hyperopic eyes of old people with dry chambers, iridectomy is thought advisable. If a secondary cataract develops, discission should be practiced early, with precautions mentioned; possibly by such preventions latent glaucoma may be avoided. Cases and authorities are cited in support of this proposition.

H. V. W.

A Case of Diplobacillus Conjunctivitis.

SCHONTE. (*Berl. Klin. Woch.*, April 18, 1898.) A man 50 years of age presented a conjunctivitis of at least two months' duration. The conjunctiva of the eyelids was red and swollen, the under lid somewhat ectropic. There was blepharitis, with scanty secretion; no photophobia; and the iris and cornea were normal. Microscopic examination of the secretion showed almost a pure culture of diplobacilli, intermingled with some diplococci, staphylococci and few micrococci-tetragenes. There were very few leucocytes. Cultures taken after treatment had been instituted did not grow. The diplobacilli were stained by Gram's method; occurred mostly in pairs, and resembled the bacilli described by Axenfeld. The case was evidently an example of the rare form of conjunctivitis described by Peters, Morax and Axenfeld. The other diplococci, which were also stained by Gram's method, were apparently identical with Fraenkel's diplococcus. Rapid im-

provement occurred under the local application of silver nitrat and the use of a solution of mercuric chlorid.

H. V. W.

Euphthalmin and Mydriatics of Short Duration.

SCHNEIDER, P. (*Zeitsch. f. prakt. Aerzte*, March 15; 1898.) For diagnostic purposes homatropin, cocain and ephedrin, and lately euphthalmin, are to be preferred to atropin and scopolamin, on account of the long effects of the latter. Evanescent dilatation of the pupil, without paralysis of accommodation, without other effects of the eye and its appendages, should be the properties of a pure mydriatic. Euphthalmin seems to best fit this description. There are no subjective complaints, injury to the cornea, or general disturbances such as haze been observed from the use of cocain when euphtalmin is exhibited. Euphthalmin is superior to homatropin in that it passes away more quickly and does not increase the intraocular tension. It may be used in glaucoma without fear. The only after effect from use of euphthalmin is in the diminishment of accommodation. This, however, passes away rapidly, and in young persons never reaches such a grade that near work cannot be done. At present euphthalmin is rather expensive, 1 gram costing \$1.25.

H. V. W.

Atropin-Conjunctivitis.

MARK, JACOB, (*Budapester med.-chir. Press*, 1897, 51 and 1898, 2,) says that in Schulek's clinic the borat of atropin is used. Atropin conjunctivitis is supposed to be caused by bacteria used in old solutions. M. cites two cases from Ahlström's, and also two original cases in which sterile aseptic atropin solutions had caused conjunctivitis. This he ascribes to individual idiosyncrasy. He saw one patient in whom one drop of atropin solution would each time produce an intense conjunctivitis. The causation, in conjunctivitis from atropin, is on account of its effect on the vessels and nerves of the membrane, which lowers the tone of the vessels; so by this means a catarrh may arise from slight irritation. Graefe has shown that this drug produces anatomical changes, and the irritability of the conjunctiva is made greater. If the mem-

brane is saturated with atropin an extra drop may cause intense inflammation, and this irritability may last many months.

H. V. W.

Hysteria Combined with Reflex Paralysis of the Pupil.

OPPENHEIM. (*Zeitsch. f. prakt. Aerzte*, No. 6, 1898.) There have been few cases reported in which during an hysterical attack paralysis of the pupil has been observed. Cases are more rare in which this symptom appears with the attack. In all these cases the paralysis of the pupil has disappeared. In O.'s case it has remained for 15 years and should not be denominated hysterical, as 15 years before the patient had brain syphilis, which was cured by inunction. This case is especially interesting, as since this time this person has had no further indications of syphilis.

H. V. W.

Amblyopia and Amaurosis in Pregnancy, Labor and Childbed.

SILEX, P., Berlin, (*Monatssch. f. Geburtshilfe u. Gynecologie*, p. 373, 1897,) has never seen pure amblyopia caused by pregnancy and has found no case in the literature free from doubt. The amaurosis of pregnancy, etc., is most commonly due to uremia following acute nephritis or diseases of the kidney of pregnancy, and is a toxic symptom. Albumen alone is seldom found without conscious changes. Amaurosis of an hysterical, epileptiform and apoplectic nature is likewise rare. In 5 out of 6 cases of amaurosis observed by S. there usually remained pupillary reaction to light. The arteries were not narrowed. This is contrary to the angiospastic theory of eclampsia. The prognosis of pupillary paralysis is favorable. If the visual acuity does not soon return to normal after an uremic attack with amaurosis there is likely to be complicating retinitis. This retinitis may readily return during a following pregnancy, S. had not seen such a return of the amaurosis in any of his cases, but it has been observed by other authors. The treatment of the amaurosis is that of the eclampsia and retinitis.

H. V. W.

Nomenclature and Terminology of Keratitis.

SILEX, P., Berlin, (*Die Heilkunde Monatsschr. f. prakt. Med. reviewed in Die Ophth. Klinik*, May 20, 1898,) divides the various forms of keratitis into the following:

1. Keratitis dendritica exulcerans myotica; 2, keratomycosis aspergillina; 3, keratitis punctata superficialis; 4, trophoneurotic superficial keratitis; 5, keratitis maculosa; 6, keratitis nummularis; 7, thread-like keratitis; 8, the clear form of thread keratitis (7 and 8 occurring after cataract extraction and discission respectively); 9, keratitis scrobiculiformis; 10, striped keratitis (occurring after cataract extraction).

In closing, the author deals with changes in the cornea which occur after the use of cocain or sublimat, which are mostly due to prolonged exposure of the cornea with eyelids open, to which he gives three subdivisions and which belong to the non-suppurative group. H. V. W.

Prophylaxis and Treatment of Blennorrhoea of the New-Born by Protargol.

FUERST (*Fortschritte in der Medicin*, No. 4, 1898), prefers protargol to nitrat of silver. Protargol is a preparation of silver, but is less easily decomposed, less irritant, easier to handle and does not stain the clothing. It is best used in 10 per cent. solution made by rubbing up 10.0 of protargol with 10.0 glycerin into a paste, and this being dissolved in 90.0 of water. H. V. W.

A Case of Hemorrhage Into the Left Optic Thalamus, Complicated by Cerebro-Spinal Meningitis.

TANTZER. (*Deut. Med. Woch.*, April 28, 1898.) A woman 47 years old came under observation with inequality of the pupils, neither pupil reacting to light, nystagmus, convergent strabismus, right facial paresis, rotation of the head to the right, somnolence and incontinence. In the course of three days coma developed, an eruption of herpes appeared, the right arm became parietic and the right leg completely paralyzed. Cocci resembling pneumococci were found in the sputum and in the fluid gained by lumbar puncture. Death ensued, and on post-mortem examination there was found injection of the vessels of the pia, with dense exudate and small hemorrhages. The third ventricle was filled with blood, which came from the anterior median portion of the optic thalamus. Tantzer believes the apoplexy was primary, and by its insult gave opportunity for infection. The earlier

symptoms were explainable upon the basis of the hemorrhage in the thalamus, consequent pressure upon the internal capsule, causing weakness of the arm and paralysis of the leg.

H. V. W.

The Relation of the Family Physician to the Ophthalmologist. ✓

Two articles have recently appeared upon this subject by Fuerst, of Berlin. One entitled "The Family Doctor and Ophthalmology," (*Deut. Med. Zeitung*, pp. 99 and 100, 1897,) and "Why Have We Learned Ophthalmology? An Earnest Chapter for Practitioners," (*Prag. Med. Woch.*, No. 5, 1898.) It is not accidental that in both the medical press of Berlin and of Prague the practicing physician is energetically warned about the amount of eye practice he may properly do. Specialization of medical science, particularly in large cities, has come to such a pass that the public commonly must have a specialist for any particular affection, and retains the family physician as a sort of overseer of the work. The subdivision of work in hospitals has popularized the specialist. Formerly the physician received his fee as an honorarium, but now the acquisition of sufficient knowledge, particularly that for an aspirant to the ranks of the specialist, takes much time, pains and money, and should be properly repaid. In the larger cities the specialists are easily obtainable and their services should be quickly obtained, for the benefit of his patients, by the local practitioner. In the country it is a different matter, and the country practitioner must handle all cases at first, and cures hundreds every year. Many cases of corneal ulcer, scrofulous ophthalmia and blenor-rhea occurring in the country cannot well go to the specialist, and may be handled at home. By the German laws, all physicians are required to know something of all the specialties. The first paper of Dr. Fuerst's gives a set of rules by which the family practitioner can regulate the amount and kind of eye work he may properly do. He gives a clear review of practical ophthalmology and its relations to general medicine.

H. V. W.

ABSTRACTS FROM CURRENT AMERICAN AND
ENGLISH OPHTHALMOLOGICAL
LITERATURE.

BY CHARLES H. MAY, M. D.,

NEW YORK.

Simple Extraction Downward.

SCHWEIGGER, PROF. C., Berlin. (*Archives of Ophthalmology*, May, 1898.) The writer advocates simple extraction downward with flap incision in the margin of the cornea. Ever since 1888 he has operated downward and has satisfied himself that this is the best method. He found that secondary cataract and losses were as frequent in the operation with iridectomy as without it. Statistics based on all cases of senile cataract operated upon by him in his private hospital from 1888 to 1895, show that simple extraction downward gives better visual results than any other of our present methods. Among 194 extractions with iridectomy there were 9 cases, or 4.7 per cent. in which $V. = 1/2 - 1$; and 68 cases, or 35 per cent. in which $V. = 1/4 - 1/2$. Among 208 simple extractions downward there were 54 cases, or 26 per cent., in which $V. = 1/2 - 1$; and 93 cases, or 44.2 per cent., in which $V. = 1/4 - 1/2$. There were 3.6 per cent. of losses with extraction with iridectomy, and 2.4 per cent. with simple extraction downward.

"The old-fashioned, simple extraction downward with a flap just inside the corneal limbus and embracing nearly one-half of the cornea not only gives better visual results than the peripheral section upward, but the method of operating is preferable. If we must operate with iridectomy, the upward incision is the best, in order to cover the enlarged pupillary field with the upper lid. But the advantage of a small, round, central pupil are not obtained in this way. If we wish to operate by simple extraction, there is no tenable ground for the upward incision at all. It was formerly argued that by making the incision upward the

margins of the incision were kept in more accurate apposition by the upper lid, and that recovery by first intention could not be so easily prevented by the restless behavior of the patients, or by contact of the margin of the lid with the flap. This is, however, an illusion, for when the lids are closed the eyeball rolls upward to the extreme physiological degree, so that the whole cornea lies beneath the upper lid, as anyone can convince himself by observing a case of paralysis of the orbicularis. Upward rotation of the eye is not a muscular effect, but an elastic force, for it appears equally in sleep, at the moment of death, and whenever during surgical narcosis muscular innervation ceases. * * *

The same upward rotation also occurs on closing the eyelids after an operation, so that in the fissure between the lids lies a considerable portion of the sclera below the lowest portion of the cornea, whilst the entire cornea is wholly concealed beneath the lid.

* * * It often happens in simple extraction upward that patients cannot possibly look down, the eye flying up at the least touch with instruments, so that during the incision and the entire operation, the eye must be pulled into view by forceps, a procedure which is prejudiced to a correct performance of the operation. For this reason many operators long ago abandoned the upward incision and made a combined extraction downward. If during simple extraction downward, the eye rolls up, no harm ensues, for the horizontal meridian of the cornea remains in sight in the aperture of the lid, widened, too, as it is by means of the speculum."

Prof. Schweigger makes the incision with a broad knife (Richter's), sharp on both edges to about 2 mm. from the tip, the back straight and thin, but not cutting, and the surfaces of the blades a trifle convex; the width of the blade increases gradually from the point, so that at about 15 mm. from the latter it is 6 mm. wide and remains so up to the base; the edge is not straight, as in Beer's knife, but a little curved. Fixation is done with a sort of two-pronged fork with buttoned ends 4 mm. apart, which prevents rotation or deviation of the globe, and permits a useful support against the knife in finishing the incision.

In the author's experience there is no advantage in the

conjunctival flap, and he has discarded it. Up to within a short time he used Bowman's double needle operation in secondary cataract, but for the past two years he has been using forceps-scissors as a substitute for the needle operation. He found prolapse of the iris just about as frequent in extraction with iridectomy as in simple extraction downward (10 per cent.), including in the former group all those cases in which there was prolapse, incarceration or synechiæ in the angles of the incision. Whenever there is an indication for iridectomy the upward incision is to be employed.

On the subject of the prevention of prolapse he says:

"It is impossible to prevent every prolapse of iris after cataract extraction. Eserin is of but little effect, because its action has mostly disappeared at the time the prolapse occurs. More than that, the contractional power of eserin over the sphincter is nothing in comparison with the power of an extraocular pressure which reopens the incision. From time immemorial efforts have been made to reduce the number of prolapses. I tried a *corneal suture* 27 times in succession in one month, but the result was 3 prolapses which had to be abscised, 3 smaller ones which were left to themselves, 3 cases of severe iritis, and some attacks of keratitis starting from the sutures. I then abandoned corneal sutures."

He next describes his attempt to prevent prolapse by a peripheral incision upward with a conjunctival flap loosened only partially so that a bridge of conjunctiva remained and the lens slipped out sideways; but even this did not prevent prolapse. His next idea was to *substitute for the iridectomy an opening in the iris*, which remained open during the beginning of the recovery, and in case of reopening of the section lets off the aqueous, but closes again. This purpose could be accomplished by a peripheral split in the iris near and parallel to its insertion.

After repeated experiments he now operates as follows:

"The incision is made downward, the capsule opened and the lens delivered. Then, in order to operate without pain, and consequently without reflex contractions of the ocular muscles, tropococain is introduced into the anterior chamber, and after three minutes, by which time complete

anesthesia is obtained, the iris is pulled forward with fine forceps and divided with a suitable knife close to the corneal incision. I tried to do this at first without local anesthesia, but it proved impossible to do it with nicety owing to reflex contractions of the eye muscles. A broad needle is pushed as peripherally as possible through the iris, and the incision widened toward each side extensively. It is quite important the corneal incision should lie close to the limbus, otherwise the incision in the iris does not fall near enough to its insertion. In order to prevent prolapse the incision in the iris should be extensive, which is not done in the small peripheral iridectomy suggested by Pflueger for the same preventive purpose.

"The iris should not be incised before the delivery of the lens, because then the latter is pushed forward through the opening, a step which hinders free delivery, and may bruise the iris tissue.

"Finally, a drop of eserine is instilled into the eye in order, by contraction of the sphincter, to keep the incision in the iris from closing too soon. This remedy can be employed at each dressing of the eye for several days, provided that it is not contraindicated. The incision in the iris generally closes completely and without a trace. Occasionally we see minute alterations at the periphery, which are, however, not at all disturbing.

"I have followed this method since the beginning of 1897, and in my last hundred extractions have seen only two prolapses that had to be abscised."

Iridectomy in Excluded and Occluded Pupil During Active Inflammation.

JACK, EDWIN F., Boston, (*Boston Med. and Surg. Jour.*, May 26, 1898.) "As far as I have observed iridectomy, in cases of iritis with blocked pupil, is done only when the eye has become free from inflammation, the object being usually to make an artificial pupil for visual purposes; sometimes, though more rarely, in order to prevent further attacks of iritis. We all know the difficulty and inefficiency of medical treatment of iritis at this stage. Mydriatics do harm rather than good, as their desired action is no longer possible and we wait patiently, relieving the pain, till the attack subsides. During this time

sight is likely to be much impaired or lost. Pain and lost vision are, however, not the only bad features of these cases. The longer the inflammation continues the less likely is subsequent operation for artificial pupil to be successful on account of the secondary changes which go on in and around the iris. These changes, briefly stated, are atrophy of the iris tissue, occluded pupil, opacity of the lens, exudation behind the iris and around the lens and ciliary bodies, which later may go on to atrophy of the globe. My own experience in operating for artificial pupil in such cases is not an encouraging one. I have removed pieces of atrophied iris apparently entire, but no vision has resulted, and investigation has showed the pigment layer still clinging to the lens capsule. At other times the tissue has been so friable that only small shreds could be picked away, leaving a very unsatisfactory opening.

"Some time ago a boy with a violent attack of iritis came under my care at the infirmary. The iris was much discolored, swollen and bombé; pain was intense. It occurred to me that there was nothing to lose, and very likely much to gain by doing an immediate iridectomy. This was done under ether, the piece of iris coming out entire. Pain ceased very soon after the operation, and, though the opening partially filled up again, the iritis quickly subsided.

"Since that time I have operated on two other cases. One of these was a lady, aged 40, who for many years had had attacks of iritis with severe pain. I was called, during one of these attacks, by her physician, with the idea of doing enucleation, as she was almost worn out with pain and had finally decided upon this radical step. The condition of the eye was that commonly seen in cases of blocked pupil. Iridectomy was advised and done without ether, the pain of the operation being severe, but not much more so than what she had borne for some time. The relief was immediate, and there was no return of trouble up to the time of her death, a year and a half later.

"The other case was a man, aged 57, with incipient phthisis and with a history of repeated attacks of iritis for 15 years. Both eyes showed the evidence of these at-

tacks by numerous posterior synechiæ. The patient was having a fresh attack in O. D. with moderate pain; it had been going on for a month, with treatment, before I saw him. During the first two weeks of my observation he was fairly comfortable, but at the end of that time the pupil became excluded and very soon occluded, the iris bombé and pain intense, completely prostrating him. Vision was reduced to the perception of moving objects at two or three feet. Iridectomy was done upward without ether. The iris immediately returned to its normal plane; the pain, though temporarily increased, requiring a subcutaneous injection of morphia, soon stopped. The opening did not fill up, allowing a vision of 0.1 some weeks later, which later still was certainly better, though no accurate test was made. Had I foreseen the good visual result in this case I would have done the iridectomy downward and not upward.

"Of course, three cases cannot serve as a definite guide for all similar ones; yet I think certain inferences can justly be drawn. The procedure is justifiable, if only for the relief of pain, and one may reasonably expect it will do that. It will also, probably in most cases, cause the rapid improvement of the iritis and at the same time prevent those secondary changes which are in some cases destructive, and which in others are a barrier to future successful operative measures. It is possible, also, that the operation may result in an immediate satisfactory artificial pupil."

A Note on a Method of Operating for Ectropion of the Lower Eyelid.

ROBERTSON, D. ARGYLL, Edinburg. (*British Medical Journal*, June 11, 1898.) "The operative procedures for the cure of ectropion of the lower lid that have been employed or recommended by various surgeons are so numerous that the following method of operating, which I have recently adopted, may have little claim to originality; at the same time, as I am unaware of any surgeon having employed exactly the same procedure, and as the results obtained have been eminently satisfactory, I have deemed it advisable to report the method for the consideration of my professional brethren.

, "The operation consists in making an incision through the skin of the outer third of the lower lid, parallel to and about a line (2 mm.) distant from its margin. When the incision has been carried as far as the outer canthus the knife is directed a little more upward, and the incision continued for about half an inch. It is then carried horizontally outward for about 3 lines (6 mm.) and lastly downward and inward, nearly parallel to the upward incision, but diverging a little from it below, for the distance of about an inch and a quarter.

"The flap of skin thus outlined is then dissected from subjacent parts and reflected back.

"Next, a suitable V-shaped portion of the whole substance of the lower lid is removed at a little distance (say 3 mm.) from the outer canthus. The 'strap' of the skin which had been reflected is now drawn upward and outward till the edge of the lid is brought up to its natural position, and the skin which it overlaps is then outlined by bringing the knife along the edge of the strap, and the portion thus outlined dissected off. Lastly, the 'strap' is then replaced and fixed in position by several sutures.

"It is advisable not to remove a large V-shaped portion of the lid at first, as a little more can easily be snipped away if on drawing the lid into position by means of the 'strap' a puckering of the edge of the lid indicates that too little has been removed.

"This operation is particularly useful in senile ectropion or eversion of the lid from long continued palpebral conjunctivitis, when the edge of the lid has traction been elongated and the curvature of the tarsal cartilage, altered, but it may be advantageously employed in other forms of ectropion also.

"The chief advantages I have found in this method of operating are: (1) That the exact amount of lid tissue that should be removed is easily ascertained; (2) that by means of the strap of skin very efficient and permanent traction on the lower lid is obtained, thus bringing it and fixing it in proper position.

"Instead of removing the skin that lies under the strap, where it is drawn up so as to bring the lid into position, a small portion of the extremity of the strap might be cut

off and the effect would be similar. But I prefer the method described, giving, as it does, a larger surfacé on which to fix the strap.

"I have only had the opportunity of performing this operation on three cases, but in all (and one was a very severe and complicated traumatic case,) the result was excellent."

Pterygium and Its Treatment.

LOPEZ, HENRY, Havana. (*Archives of Ophth.*, May, 1898.) The writer classifies this disease into two clinical forms: First, true pterygium; second, pterygoid, or false pterygium; and gives the following differential table:

PTERYGIUM.	PTERYGOID.
1. Is a partial hypertrophy of the bulbar conjunctiva, which adheres to the cornea.	1. Is the adherence of a fold of normal conjunctiva to the cornea.
2. Produced by the traumatic action of dust upon the eye.	2. Consecutive to ulcers of the cornea.
3. Appears in adult life.	3. Occurs at all ages.
4. It is due to desquamation of the epithelium of conjunctiva and cornea.	4. The adhesion necessitates the presence of an ulcer of the cornea.
5. Situated superficially; it does not go beyond the anterior elastic lamina.	5. Situated deeply in the true structure of the cornea.
6. Triangular in form. Its head has a well-marked white border.	6. Triangular or quadrangular in form. Has no white border.
7. Formed in the horizontal diameter, internally or externally.	7. Has an intermediate direction.
8. Adherent to the bulbar conjunctiva, at least in its axis.	8. It may have a bridge which permits a probe to be passed underneath it.
9. Subepithelial progressive course until it reaches the center of the cornea.	9. Remains stationary at the point of adherence.

10. The adjacent cornea 10. May be surrounded by
is transparent. a zone of infiltration.

11. Can be detached by 11. It is impossible to de-
traction. tach it by traction.

He believes that pterygium, which is the typical form of the disease, has two distinct periods of development: 1st, pinguecula; 2d, pterygium, properly speaking.

A Contribution to Our Knowledge of the Etiology of Inflammations of the Accessory Sinuses of the Nose.

HOWARD, W. T., JR., and INGERSOLL, J. M., Cleveland, Ohio. (*American Journal Med. Sciences*, May, 1898.) The writers examined the material from eighteen cases of inflammation of the maxillary antrum and the frontal and ethmoidal sinuses, both microscopically and by culture methods. These investigations form the basis of a very instructive paper, terminating with the following conclusions:

"It is seen, then, from the foregoing facts, that acute and chronic inflammations of the accessory sinuses of the nose are not caused by a single micro-organism, nor even by a single group of micro-organisms. It is, however, demonstrated that with a few exceptions (*aspergilli* and *vermes*) inflammations of these cavities are caused by bacteria.

The bacteria found, as would be expected, are those that are commonly present in the buccal and nasal cavities; in the former in health and in the latter occasionally in health, and usually in disease, such as acute and chronic rhinitis, (both atrophic and hypertrophic) nasal tumors, and the like. While these organisms are the most frequent invaders of these sinuses, there are a number of cases in which certain bacteria less commonly present in suppurative processes, have been found.

"It is interesting to recognize that the common agents in the causation of inflammations of other parts of the air-passages (the *diplococcus lanceolatus*, the pyogenic staphylococci and streptococci, the bacilli of the group of Friedlander's bacillus (*B. mucosus capsulatus*), the *B. diphtheriæ*, and the *B. influenzae*) are the most important and the usual micro-organisms found in inflammatory processes of these adjuncts to the respiratory system.

"The relation of the infectious diseases, both local and general, to these inflammations is of great importance.

"There are two groups of these cases, the first, in which the accessory sinuses are invaded by a direct extension of the inflammatory process, as in acute and chronic rhinitis, coryza, influenza, diphtheria, pharyngitis, tonsillitis, tuberculosis, syphilis, nasal tumors, erysipelas, and injuries; and, second, those cases in which parts of the body remote from the sinuses are primarily affected, as in erysipelas, articular rheumatism, pneumonia, phthisis, meningitis, and suppurations in general, or diseases in which the whole system is involved, as measles and scarlatina; in all of which the normal resistance of the sinuses is so lowered that the bacteria which reach them from distant parts by means of the blood, or from neighboring parts by the spreading of the inflammatory processes, set up inflammation.

"Fraenkel is the first to suggest that inflammatory processes of distant parts of the body may be the source from which micro-organisms may reach the accessory sinuses by means of the blood. Some of his cases strongly support this view.

The finding of Fraenkel of inflammation of these sinuses in individuals suffering with chronic diseases such as nephritis, arteriosclerosis, and lung tuberculosis, which are now proverbially known so to lower the general resistance as to favor secondary infections, is of special interest. Cases may also be cited to show that inflammations primarily in the accessory sinuses may be the starting point for infectious processes in other parts, not only by spreading of the process by continuity, but by distant metastases by means of the circulation."

Operative Treatment of Lesions of the Frontal Sinus.

GOLOVINE, S. S., Moscow. (*Archives of Ophthalmology*, May, 1893.) Dr. Golovine's paper which contains a full discussion of this subject illustrated with the histories of many cases, concludes as follows:

"In using the methods described in this article, my aim has been to obtain a complete obliteration of the frontal sinus with as little facial deformity as possible. Further experience will show which of these methods will yield the

best results, and in which cases. The following are my conclusions:

"I. As the complete obliteration of the frontal sinus is easy to accomplish, it ought to be adopted as the base of operation, and on account of offering a sure guaranty against relapses. This obliteration can also be made without injury to any of the bony walls of the sinus.

"II. It is wise to broaden the operative field in lesions of the frontal sinus in order to prevent complications.

"III. In all cases of empyema of the frontal sinus, combined with affections of other cavities (Highmore's antrum and the ethmoidal cells) it is wise to begin by treating the sinus, for this, on account of its position, presents a source of secondary infections for the above named cavities.

"IV. The operative method best suited to each individual case should be chosen.

"V. Simple trephining with curettement of the mucous membrane is uncertain. Several cases have been cited where after such treatment there have been relapses.

"VI. Kuhnt's method, in principle, is a valuable acquisition to the surgery of the frontal sinus, and it is most indicated in cases complicated with cerebral symptoms, and also where there is necrosis of the anterior wall.

"VII. The osteo-plastic method, with the modifications I have proposed, is preferable in all simple cases and in exploratory operations, as it leaves but little facial deformity.

"VIII. In all neglected cases suppurating freely, as well as in relapses the result of former operations, the use of steam is most valuable, as it offers a sure though slow obliteration of the sinus.

"IX. Steam may also be used as an aid in the osteo-plastic operations.

"X. Peroxide of hydrogen is an excellent post-operative remedy. On account of the vaporization of the oxygen it penetrates all parts of the sinus.

"XI. The drain tube should be kept at least two months in the nose, as the bony granulations form very slowly.

"XII. In particular cases with large fronto-nasal cavities, the traditional drainage may be dispensed with."

Aqueous Extract of Suprarenal Capsule in Ophthalmic Practice.—The Use of Suprarenal Capsule in Minor Eye Surgery.

KYLE, JOHN J., Marion, Ind., and MULLEN, JOSEPH A., Houston, Texas. (*Ophthalmic Record*, April and June, 1898.) Dr. Kyle and Dr. Mullen report favorable experiences with suprarenal capsule and substantiate the claims made by Dr. Bates in 1896. The two papers agree in attributing to the local use of this remedy the following actions: There is no mydriatic or myotic effect. The conjunctiva, whether normal or congested becomes pale, owing to contraction of the blood vessels, and after the astringent effects have disappeared, there is no subsequent congestion. It has a decided hemostatic effect. It increases and prolongs the effects of cocain, and lessens the amount of the latter necessary to produce complete total anesthesia. In operating upon Meibōmian cysts and upon the lacrymal sac, the preliminary use of the solution of suprarenal capsule causes the cocain to act very much more effectively. The local application is never attended by constitutional effects. It is well to use a freshly prepared aqueous solution by dissolving 5 grains of the dried and powdered suprarenal gland in 1 drachm of cold water and filtering.

Sympathetic Ophthalmia.

SHAW, CECIL E., Belfast. (*The British Med. Jour.*, June 18, 1898.) The writer reviews the various theories which have been brought forward to explain sympathetic ophthalmia, and speaks of the objections to the acceptance of any of these. He relates his own work, which consisted of the pathological examination of eyes removed on account of injury, and of experimental research to determine what changes, if any, follow prolonged irritation of one eye, both with and without traumatism. His results were negative, and are given in the following summary:

“Practically the whole weight of the experimental evidence, and the greater portion of the clinical evidence, which has accumulated since the publication of the migratory theory, either fails to support that theory or is actually opposed to it. Even Deutschmann, the propounder

of the theory, has in his last papers come very near contradicting his earlier observations; and, if his theory is to stand, it can only be on the assumption that the migratory germs are of such a nature that they can neither be inoculated, cultivated nor stained by any known method—an assumption for which there is no ground whatever.

“It seems to me that we are obliged to fall back on some form of the old theory that sympathetic ophthalmia is due partially, if not entirely, to irritation of the ciliary nerves. No doubt there are some difficulties in the way, which experimenters have so far failed to remove, but in seeking for an explanation of these failures several possibilities are open to us.

“The common occurrence of sympathetic irritation in one eye after injury to the other is generally acknowledged, and it may be that the mechanism by which this irritation is conveyed differs in man from that in dogs, rabbits and guinea pigs, and this seems not so unlikely when we remember the anatomical arrangement of the whole ocular apparatus in man, designed to secure binocular vision. Or it may be that the explanation lies in the anatomical and physiological relationships of the nervous mechanism conveying the irritation, of which we as yet know nothing, and I believe that it is by the study of these relationships that our knowledge of the cause of sympathetic ophthalmia is most likely to be extended.”

Ophthalmia in Newly-Born Children.

STEPHENSON, SYDNEY, London. (*The Medical Press and Circular*, May 25, June 1 and June 8, 1898.) Mr. Stephenson has written a very full and instructive paper on this subject. He distinguishes between two forms of the disease, the gonorrheal and the non-gonorrheal, explaining that “it is now well understood that a milder ophthalmia is met with in babies, and that gonococci are not to be demonstrated in the eye-discharges in such cases. Other microbes, however, are to be found, of which the most common are three in number, (1) the short bacilli of catarrhal conjunctivitis, (2) the pneumococci of Fraenkel, and (3) the diplo-bacilli described by Morax.”

He gives a table of 446 cases reported by various observers, showing that in 72 per cent. of cases of ophthal-

nia neonatorum gonococci were found in the conjunctival discharge, hence, "two-thirds of the inflamed eyes of babies are due to the micrococcus of gonorrhea. The ground for subsequent discussion has been cleared by recognizing the existence of a severe form of ophthalmia, set up by gonococci, and of a milder form, the outcome of the action of certain other micro-organisms. It is of clinical moment to differentiate between the two types, while the distinction is by no means difficult to establish,"

The writer then describes quite minutely the well-known symptoms, causes, complications and sequelæ which occur in the severe cases. Regarding the milder ones, the non-gonorrheal, he says:

"They occur at some period after the fifth day from birth; soon recover, with or without treatment; and rarely entail damage to the cornea. They are marked by slight puffiness of the upper lids, some little thickening of the palpebral conjunctiva and a blood-shot appearance of the eyeball. They present merely a small quantity of yellow-white discharge, which collects in the conjunctival sac, and when it dries, glues, so to speak, the lashes to the skin. Their commonest cause is the micro-organism now known to give rise to 'blight,' or catarrhal ophthalmia, viz., Weeks' bacillus. The practical importance lies in the fact that in the absence of a microscopical examination they are likely to be mistaken for the more serious form, an error that may cause needless alarm, both to parent and practitioner. There are no special complications."

In the chapter on diagnosis the writer alludes to one condition which is likely to be confused with ophthalmia, namely, disease of the lacrymal sac. This is not altogether uncommon, is unilateral, may sometimes be recognized by obvious distension of the region of the lacrymal sac, and in other cases by the escape of pus through the puncta after pressure upon the sac.

Full directions for the examination of the secretion of ophthalmia neonatorum by cover-glass preparation are given. For staining the smear he prefers either carbol methylene blue, or carbol. fuchsine Kühne's solution is thus prepared: Rub together in a glass mortar 1.5

gram of methylene blue (Grübler's) and 10 cc. of absolute alcohol, add 100 cc. of a 5 per cent. solution of carbol. fuchsin, or Ziehl's solution is as follows: Rub in a glass mortar 1 gram of fuchsin (Grübler's) and 10 cc. of absolute alcohol, add 100 cc. of a 5 per cent. solution of carbol. acid and filter.

Hé describes the appearances of the gonococci under the microscope when stained by these methods, and adds: "Associated with the microbes of gonorrhea one finds, in perhaps one-third of the cases, ordinary pus-cocci (staphylococci or streptococci). My impression is that the later the stage the more likely are these other organisms to be present. They are probably the outcome of a secondary contamination. I need hardly remind you that they stain by Gram's method. From a clinical point of view, any discharge from an inflamed conjunctiva which is found under the microscope, to contain cocci and diplococci grouped within the protoplasm of the pus cells is most likely gonorrheal. Should these organisms stain with methylene blue and fuchsin, but part with their gentian violet when Gram's plan is employed, the probability that they are gonococci becomes converted well nigh into a moral certainty.

"I would warn you against hastily concluding, from a single examination of the pus, that gonococci are absent. Before that can be safely affirmed it is necessary to make at least two investigations on separate occasions. The reasons for this precaution are simple: (a) Owing to faulty methods, organisms, although present, may not be stained; (b) a few scattered microbes may be readily overlooked in searching through a microscopical specimen."

In an appendix *Gram's method of staining* is described as follows: "The cover-glass preparation is floated, smeared side downward, for two or three minutes in aniline genetian-violet. This stain is made by shaking together and then filtering one part of aniline oil and twenty parts of distilled water. Before use, a small quantity of saturated solution of genetian-violet (Grubler's) is added and the mixture filtered through paper that has been moistened with distilled water. The preparation is next

floated for a minute in Gram's differential solution; *i. e.* iodine, one part; potassium iodide, two parts; distilled water, 300 parts. The specimen is afterward decolorized by allowing it to lie in absolute alcohol until no more stain comes away from its smeared surface. It is then dried and mounted in xylol balsam. One or two precautions should be observed if fine preparations are to be obtained by Gram's plan. First, a thick pus-film should be cleared by immersion in acetic acid (15 per cent.) for a few minutes; the acid is washed away with distilled water before the cover-glass is placed in the aniline genetian-violet. Secondly, the aniline genetian violet should be thin enough to allow light to pass readily through a test tube containing the liquid. Lastly, all solutions ought to be carefully filtered."

Next follow chapters on prognosis and treatment. The general treatment of the infant is discussed, this resolving itself mainly into a question of diet. He describes the prognosis good when (a), the case comes under observation before the cornea is affected; (b), when the baby is well nourished and free from inherited disease; and (c), when there are no local conditions that militate against recovery, such as congenital smallness of the lids.

The Diagnosis of Diphtheria of the Conjunctiva.

STEPHENSON, SYDNEY, London. (*British Medical Journal*, January 18, 1898.) After speaking of the occurrence of diphtheria of the conjunctiva in various countries and the predisposing factors, and giving the full history of two cases, the writer discusses the question of diagnosis as follows:

"In considering the question of diagnosis, we must at the outset recognize the clinical fact that the severity of conjunctival diphtheria varies much. Thus, its signs are sometimes of so trifling a nature that they may be easily put down to a wrong cause, unless associated with diphtheria elsewhere, or followed by nervous sequelæ. On the other hand, they may be so decided that the cornea may be destroyed within twenty-four hours; even life itself may be lost, although a fatal result does not seem to have been recorded unless diphtheria of other parts was also present. These latter cases are the only ones that have

been looked upon as diphtheria of the conjunctiva—at all events until recently, when bacteriological researches have become more or less general.

“Similar differences in regard to severity, it is well known, occur in many other inflammations of the conjunctiva. It would be a trueism to say that in diphtheria of the conjunctiva (as in all ailments due to microbes) the clinical appearances must depend upon the relationship that exists between two factors: (1), the virulence of Klebs-Loeffler and of any associated germs; (2), the resisting powers, local and general, possessed by the patient. There is experimental proof that the virulence of certain bacteria may be heightened or lowered according to environment, as in Marmorek’s well known and widely quoted experiences. That observer found that the pathogenic powers of the streptococcus pyogenes might be exalted to a high medium made of blood serum and bouillon, while even a highly virulent culture soon lost its malignant properties when grown *in vitro*. As to the second point, every practical surgeon knows that the clinical appearances of a particular affection will vary according to the patient’s age, family tendencies, state of health, and so forth.

“We must, I think, now recognize with certain continental writers, that diphtheria of the conjunctiva may clinically be met with under three forms, namely, the interstitial, the superficial membranous, and the merely catarhal.

“Indeed, the diagnosis of conjunctival diphtheria is by no means so simple an affair as one might at first sight be inclined to think. The history of the case may sometimes lead one to a correct conclusion. There may, of course, be a clear history of infection, as when a physician engaged is examining a diphtheritic throat, is so unlucky as to have a morsel of the specific membrane coughed into his eye. In such an event, the presumption will be that any resulting inflammation in the physician’s eye will be of a diphtheritic nature.

“As an instance of the same sort take again, a case related by Fuchs: A child, laboring under throat diphtheria, was placed in the children’s ward of a general hos-

pital. The consequence was that, whereas the patient's right-hand neighbor developed faucial diphtheria, his left-hand neighbor soon showed symptoms of conjunctival diphtheria. Therefore, a clear history of infection, when it can be got, is of great value in helping toward a correct diagnosis. In the same sort of a way, importance must be attached to the prevalence of diphtheria in the neighborhood whence the patient comes or the house where he lives.

"The coexistence of diphtheria of the fauces, nasal or buccal mucous membrane, skin, vulva or elsewhere, would suggest the nature of the eye mischief; but even then, proof as to the identity of the two affections would be lacking in the absence of a bacteriological examination. The occurrence, within two to five weeks after inflammation had subsided, of loss of knee jerks or of paresis in various parts of the body would be almost conclusive with regard to the nature of the antecedent eye ailment. Such cases have been recently recorded in England, by Mr. Silcock, Dr. Collins, and others. But these signs, valuable though they may be, come too late to be of any service from the therapeutic point of view, which is all-important now that we possess antitoxin. In diphtheria of the fauces or larynx, as everybody knows, the urine is often found to contain albumen from an early period of the disease, and this sign would be helpful if it chanced to coincide with a membranous conjunctivitis, as in cases lately reported by Dr. W. J. Collins, and Mr. Percy Fleming. Albumen, however, has not been present in any of my patients. Indeed, in this particular form of disease, as in wound diphtheria, the existence of albumen is possibly the exception rather than the rule. Still, it is always advisable to test the urine of any patient who presents membrane upon an inflamed conjunctiva.

"One must recollect that the mere presence upon the palpebral conjunctiva of a false membrane is not conclusive as to the nature of the inflammation. As a matter of fact, a fibrinous exudation may take its appearance in almost any form of conjunctivitis, supposing the inflammation to be severe enough to give rise to a coagulation necrosis. For example, it is not unknown in the purulent ophthalmia of the newly-born, as pointed out by Chaisaig-

nae many years ago. It forms an almost constant sign of the inflammation set up by pneumococci; it is sometimes seen in that form of conjunctivitis which is associated with Week's bacilli; while I have observed it along with pus cocci, as in a case recorded by me in the *Lancet* of November 13, 1897. Apart from these acute conditions there is a curious chronic affection, where the thick, grayish fibrinous exudation is seen upon the palpebral conjunctiva for weeks or months together. The malady does not seem to be contagious, generally occurs in delicate children, and sometimes implicates the cornea. Instances have been reported in this country by Hulme, Mason, Hogg, Nettleship, Critchett, Juler, Bronner and Stanford Morton. Then, there is the fact that false membrane may follow injuries to the conjunctiva, whether mechanical or chemical.

"Lastly, cases have been published by Sourdille, Aubineau and by H. Coppez, where Klebs-Loeffler bacilli were present, but membrane was absent. Hence, there is nothing in the least pathognomonic about the presence or absence of these fibrinous conjunctival deposits. Neither can any conclusion be safely drawn from the naked-eye characters of the film, which in diphtheria is sometimes but lightly adherent to the mucous membrane, whereas at other times it can be peeled away with difficulty, or not at all. Any attempt to base a diagnosis upon the state of the underlying conjunctiva when the membrane has been stripped off appears to be fallacious. At all events, it could only be in the most pronounced cases, where the subconjunctival tissues were densely infiltrated ('brawny') that a conclusion might, with tolerable certainty, be reached as to the nature of the diseased process. The existence small, dusky-red hemorrhages, scattered over the surface of the diphtheritic plaques, has been a notable feature in some of my cases, although not observed in the present ones. For my part, however, I should hesitate to lay any great stress upon the point.

"It is now well known that the preauricular glands (between which and the conjunctiva there is a direct connection,) are liable to become involved in various forms of conjunctivitis. Some few years ago I described a case of

unilateral conjunctival diphtheria, in which the corresponding preauricular gland was swollen and markedly tender. But further experience has convinced me that no dependence is to be placed upon this sign, since the glands in question sympathize more or less with many of the severer conjunctival inflammations, especially when due to such organisms as tubercle bacilli and gonococci. For that matter, it was not observed in the two cases that form the text of the present communication. A similar remark applies to implication of other glands, as those about the angle of the jaw, which may or may not be enlarged.

"In short, as it seems to me, the diagnosis of this ailment must be grounded upon one feature only—the *presence of diphtheria bacilli*. If these are found there can be no reasonable doubt as to the nature of the case, while their absence after repeated and careful examination tends to show that one is dealing with some other malady. In the latter event, a conclusion must be based on (a) the organisms demonstrated in membrane or discharges from the eye; (b) the general features of the inflammation; (c) the history of the case. In conjunctival diphtheria, then, as in diphtheria of the fauces and elsewhere, the discovery of Klebs-Loeffler bacilli must be regarded as the only certain, trustworthy and scientific way of diagnosing the disorder, a fact that I have emphasized elsewhere.

"It is hardly necessary to make any remarks as to the method of identifying the bacillus in question, since that is so well understood at the present time, I will merely say that in conjunctival diphtheria the making of cultivations should not be employed to the exclusion of simpler means. Morax has pointed out (and I am in a position to confirm his statement,) that in a certain number of cases the discharge from the eye contains only that microbe which is the cause of inflammation. Hence, in marked instances, examination of film preparations has brought to light such numerous and characteristic Klebs-Loeffler bacilli that he has been able at once to affirm the nature of the disease. There is one other point that should certainly be alluded to, namely, the confusion likely to arise between Klebs-Loeffler bacilli on the one hand and xerosis bacilli on the

other. The latter are to be found in very many cases of conjunctivitis, and so marked is their resemblance to diphtheria bacilli that a mistake may be easily made if the investigation be not conducted with an eye to the fallacy.

"Briefly, the main points of distinction are these:

"1. Both stain by Gram's method, but in my experience the diphtheria organism loses its gentian violet, when in alcohol, much more quickly than the xerosis bacillus. 2. Klebs-Loeffler bacilli, according to Dr. Eyre, give rise to an acid reaction when grown in neutral bouillon or milk, while xerosis bacilli never do. 3. The xerosis organism, when inoculated into guinea pigs, causes nothing more than a swelling at the site of the puncture."

Unilateral Retinal Changes in Cerebral Hemorrhage, Embolism and Thrombosis.

WILLIAMSON, R. T., London. "It is well known that in a large number of cases of cerebral hemorrhage, ophthalmoscopic examination reveals albuminuric retinitis in each eye. It is also well known that in cases of cerebral embolism, associated with ulcerative endocarditis, hemorrhages and white patches may sometimes be found in each retina on ophthalmoscopic examination. Occasionally embolism of the central artery of the retina, with its characteristic ophthalmoscopic appearances, may be associated with cerebral embolism; but such an association is exceedingly rare. In patients suffering from arteriosclerosis minute changes may be found in the retinal vessels—general or localized—narrowing of the arteries, white lines along the sides of the arteries, localized narrowing of the veins, localized varicose dilatations, etc., and of course these may be present when cerebral hemorrhage occurs. Other rarer retinal changes have occasionally been found in cerebral hemorrhage and softening.

"But, apart from the changes just mentioned, I have observed two others in certain severe cases of cerebral hemorrhage, embolism and thrombosis, namely, retinal hemorrhage or dilatation of the retinal vessels in the eye of the same side as the brain lesion, whilst the opposite retina has not presented any of the changes."

The writer gives brief abstracts of notes on the oph-

thalamoscopic examination of 13 severe cases of cerebral hemorrhage, embolism and thrombosis; in 12 the examination was made shortly before death; in 11 the diagnosis was verified by post-mortem examination. In 8 out of the 13 there were unilateral retinal changes on the same side as the brain lesion, while the other retina was not affected by the changes. His conclusions are:

1. In cases of hemiplegia from cerebral hemorrhage which terminate fatally, large hemorrhages are not infrequently found in the retina on the same side as the brain lesion, whilst no hemorrhages are present in the opposite retina.
2. In cerebral embolism the same retinal condition is occasionally met with; also in cerebral embolism occasionally the retinal vessels are slightly dilated on the side of the brain lesion.
3. In thrombosis of the middle cerebral artery, when the thrombus extends down into the internal carotid, the vessels of the retina on the side of the brain lesion may be markedly dilated and tortuous, whilst the retinal vessels of the other eye are normal."

Ophthalmic Evidence of General Arterial Disease.

GUNN, R. MARCUS, London. (*The Lancet*, March 26, 1898.) After referring to a case which he had shown at the society some years ago, Mr. Gunn went on to describe the appearances seen in the arteries affected, as part of a change in which the arteries of the body generally and of the brain in particular shared. The general reflex from the vessel was brighter than normal, the central light sheath was bright, and the whole artery was of a lighter color than normal. This was due to hyaline changes in the arterial walls; as a consequence of this change the circulation in the veins was impeded and in some cases the vein became invisible where crossed by an artery. As a further result of this venous obstruction there was set up an edema of the retina, which might be either general or partial, the effect of which was to blur the details of the fundus. In some cases the size of the arteries was not uniform; the vessel would be narrowed at one spot or increased in a certain part of its course; this change was most often seen in the small arteries in the region of the macula. The arteries were sometimes very tortuous. The central streak was narrow, bright and with points of

greater brilliance in it; this condition was also seen in hypermetropia and after optic neuritis in the vessels arising from the optic disc, but in diseased vessels it was those of the second and third magnitude which should be looked at. There was a loss of translucency of the arteries so that where the vein passed behind the artery it could not be seen. On the other hand, if the vein covered the artery, the artery could be unduly seen through the blood column in the vein, because of the thickening of the arterial coat and partial emptying of the vein by the thickened artery, as the two crossed each other. As a consequence of the hardness of the arteries there was an interruption of the venous current, the vein was distended, and often hemorrhages took place along its course. The change in the arteries was a change in the coats, an irregular thickening, with this there was a loss in carrying power and hence tortuosity. The change in the veins was due to the damming back of the blood; the walls of the veins and capillaries underwent degeneration, hence arose the hemorrhages. The question of etiology was one for the physician. The change usually occurred between forty and fifty. If well marked at this age, the prognosis was grave. The patients had often been subject to migraine, indigestion or gout. Chronic alcoholism was also a factor in the causation. In some of the cases known as hemorrhagic glaucoma this affection of the vessels was the cause of the changes which gave rise to the hemorrhages. It was in close association with renal disease, but the vessels of the eye and brain might be affected before the kidneys. He had examined the eyes of all the patients in the National Hospital at one time who had hemiplegia. In seven the arteries were normal, in ten they were affected, and in seven the changes were quite characteristic.

A Mnemonic for Ocular Paralysis.

MADDOX, ERNEST E., Bournemouth. (*The Ophthalmic Review*, February, 1898.) "Mnemonics afford considerable aid to beginners, and to those who cannot confidently trust themselves to mental processes in the conditions of haste under which diagnoses have frequently to be made. They are not, of course, intended to replace an intelligent understanding of the *modus operandi* of the ocular mus-

cles, but only to supplement it, their value being proportionate to the impossibility of making a mistake in their use, and, it may be added, of forgetting the mnemonic. They should, in short, be both simple and safe.

"The many excellent mnemonics which already exist, since they are based on the hypothesis that every paralysis is typical, are more or less unsafe in the large proportion of atypical cases which are met with. This is not to say that they have not their own proper value after the diagnosis, to confirm it in all its details, if the case prove typical; but for the primary diagnosis a mnemonic should depend only on those signs which are constant and reliable, and should not depend, therefore, too much on the horizontal element of the diplopia, (except in the case of internal and external recti) nor yet on the torsion of the false image. For example, it is well known that in paralysis of any one of the obliques, a pre-existing latent divergence (exophoria) may be set free, (*i. e.*, cease to be latent and become manifest), in the diplopic area of the field, and may so complicate the case as to convert the typical "homonymous" diplopia into "crossed diplopia."

"A similar complication may occur, though less likely to do so, in paralysis of the superior and inferior recti, where there is a possibility of a pre-existing latent convergence (esophoria) converting the typical "crossed" diplopia into "homonymous."

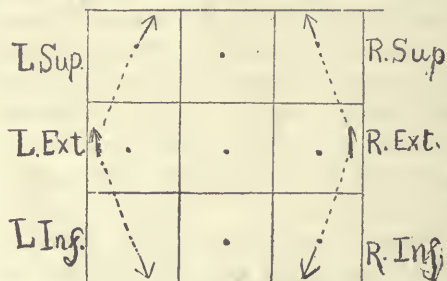
"Further, with regard to the torsion of the false image, Mauthner called particular attention to the untrustworthiness of the answers given by patients on this point, though it is true that by using the glass rod the difficulty is sometimes lessened, the tilting of a long streak of light being pretty easily observed.

"In addition to this, I imagine that cases occur in which, however accurate the patient may be in describing the false image, the paralytic torsion is (at least in parts of the field) overborne by a greater pre-existing latent torsion exerted in the opposite sense so as to completely mask or falsify the paralytic torsion, and thus make the nature of the torsion become a misleading index. In confirmation of this, it may be mentioned that on incidentally testing a refraction case, I found as much as 10° of latent outward torsion

with distant vision, which increased to 20° with vision for twenty inches. Such cases must be rather rare, but should any one so circumstanced subsequently develop paralysis of an outward torsion muscle (inf. rectus or inf. oblique), the latent condition would probably reverse the torsion of the false image. The only way to detect the reversal would be to study the torsion in all parts of the field. In another patient (complicated, however, with incomitant hyperphoria, so that it was not so remarkable) I also found 10° of latent torsion in distant vision. Both of these patients were men, and both had a persistent tendency to headache, though it would be rash to assume too confidently that the latter depended on their ocular equilibrium.

"All these considerations accentuate the value of Mauthner's excellent advice, to pay attention only to the vertical element of the diplopia in paralysis of the torsion-producing muscles, at least for the rough primary diagnosis.

"The proposed mnemonic consists in so naming the areas



Mnemonic device showing the nature of the diplopia for each muscle; also the "namesake" description of the areas. The dots in the center of each area are the true images, and the arrows the false images. Thus, the arrow in the right superior area shows displacement and tension of the false image in paralysis of the right superior rectus, or its associate, the left inferior oblique; in the left inferior area of the left inferior rectus, or the right inferior oblique, and so on.

of the field of diplopia that the area of greatest *vertical* diplopia shall be the namesake either of the affected muscle, or of its true associate in the other eye. Happily no arbitrary nomenclature of the areas is required, since their own proper names afford just what is wanted.

"There is, therefore, no effort of memory, each area having its natural name from the patient's point of view.

Thus the *right superior* area is that which lies in the upper part of the field, to the patient's right. *Maximum vertical diplopia* found in this situation means paralysis of the namesake muscle, the *right superior rectus*, or else of its true associate in the other eye, the *left inferior oblique*. It is easy to settle between these two by finding to which eye the false image belongs.

“‘True associates’ can always be borne in mind by remembering that their names are the most contrary possible. For example, *left inferior oblique* is in every term opposite to *right superior rectus*.

“In short, having found the area of the greatest *vertical diplopia*, the paralyzed muscle is *either the same named rectus or its cross-named oblique*.

“As regards the less important torsional and horizontal elements of diplopia, the same diagrammatic mnemonic device makes them quite easy to remember, and if once constructed by the reader, is easily imprinted on the memory. The dotted ‘lines of direction,’ drawn from the false images of the external recti to the center of the corner areas, need only be produced beyond those centers to show the sense of the torsion, and also the direction of the horizontal displacement of the false image in the diagnostic area of each muscle. Thus, in the right superior area the diagram represents the false image of the right superior rectus; and by the same arrow that of its true associate, the left inferior oblique, both as regards the levo-torsion and the levo-duction, which are common to both. Of course, the torsion is greater and the vertical separation less in the case of the obliques than in that of the recti, but the diagram is not meant to be used thus quantitatively, but only qualitatively. To use it more quantitatively we should have to imagine the lines of directions to be wires, and that we could lay hold of the false images of the external recti and draw them further apart; we should thus alter the false images in the corner squares to resemble those of the obliques. On the contrary, were we to press the false images of the external recti more closely together we should make the lines of direction become almost vertical, and then the false images in the corner squares would more truly represent those of the superior and infer-

ior recti, the vertical displacement being increased and the torsional lessened."

Thiosinamine.—A Clinical Contribution to Its Study.

SUKER, GEO. F., Toledo, O. (*Ophthalmic Record*, May, 1898.) The writer gives the histories of 4 cases taken from a series of 12, to illustrate the possibilities of success when thiosinamine, and nothing else, is employed:

"Though more clinical evidences are required before unreservedly endorsing thiosinamine, and incorporating it into our ophthalmic therapy, it is worthy of a fair trial in all cases of corneal opacity, either recent or of long standing. Then, too, the writer wishes to say that, judging from results in choroiditis exudativa, it is entitled to a thorough trial in similar cases. Knowing, as we do, the sad prognosis that stares this class of patients in the face it is no more than just that we should give them any benefit we can, even if we have to resort to the new medication herein outlined.

"Whether or not it would be of any benefit to combine thiosinamine with potassium iodide in syphilitic choroiditis remains to be proven by future clinical evidences. It does seem rather reasonable to employ it, since its action is similar to that of potassium iodide. The writer is using this combination in several cases, and with apparent success.

"If further trials substantiate the present observations, and time proves the results obtained as permanent, then we have in thiosinamine a truly valuable remedy. It will, therefore, be of equal service to the general practitioner and ophthalmic surgeon, as well as a boon for many an afflicted patient. The clinical results which the writer has had in several cases of catarrhal deafness will be reported in another communication elsewhere."

Dr. Suker gives the characteristics of this chemical and the symptoms which follow its use; also its mode of administration in detail. He reports two cases of exudative choroiditis and two cases of corneal opacities; in all he obtained favorable results.

When and Why Shall We Operate in Insufficiencies of the Ocular Muscles?

DUANE, ALEXANDER, New York. (*New York Medical*

Journal, June 4, 18 and 25, 1898.) Dr. Duane has written a very full, interesting and practical paper on this subject; he records 20 cases and analyzes and discusses their histories. He cites his experience during eight years and these, considering the writer's well-known work in this direction, are worthy of attentive consideration.

Commenting briefly upon the *objections* commonly urged against these operations, he says:

"These objections are:—

"1. The conditions for which the operations are done are *comparatively rare*. This, however, is certainly not so. The conditions in question only seem rare; when looked for systematically, they are found to be frequent enough. Thus, of the last 100 cases that I examined in private practice, in which the muscular condition was determined, I find that only in 45 could the eyes be regarded as properly balanced. In 35 there was a slight muscular anomaly, and in 25 a well-marked one. And from previous investigations I am inclined to think that this proportion is rather under than over the truth. Of course, this does not mean that because 25 per cent. of our eye patients have a muscular anomaly, anything like that proportion will require an operation, or, indeed, any treatment whatever for the anomaly; any more than the fact that we find only 14 per cent. of children to be emmetropic means that six children out of seven should wear glasses. It does mean, however, that the condition of heterophoria is much more frequent than many suppose, and that it, no doubt, requires correction much oftener than is supposed.

"2. The second objection is that the conditions, although frequent, are *variable and inconstant*—showing spontaneous changes in amount or character, or even disappearing altogether. Now, while this is true of some cases, I think that I can affirm from pretty prolonged and careful observation that it is not true of many. In most of the cases that I have watched, the conditions have either remained constant for a long period, or have changed in a perfectly definite way and for a definite reason. This was strikingly shown in Cases I and II, which have been under observation for ten and eleven years, respectively, and in which the examinations made at different times during

these periods have given uniformly concordant results; also in other cases not here recorded, and not operated upon, which were under observation nearly as long; and in still others, which have been followed for two or three years at least.

“Nevertheless, the objections hold good in some cases, and hence an operation should never be decided upon hastily. In my own practice, in order to ascertain in any given instance whether the deviation is varying or constant, I try to keep the patient under observation for a month—in cases of doubt for a longer time—before determining upon an operation.

“3. The third objection is that the muscular trouble, when present, *is not the cause of the symptoms*. This also is true in part, as was well seen in Cases II and IV and in several others that might be adduced. And the fact that it is sometimes true should lead us to be cautious in our diagnosis and to exhaust other means of treatment before proceeding to operation, even when the latter seems directly indicated. Hence, in any given instance I try first to find what I can effect by general and tonic treatment, by muscular exercise (particularly exercise of the eye muscles with prisms), and by correction of the refraction. I usually try these measures for a month or more before I think of deciding upon an operation. At the end of that time it may happen that the deviation itself has disappeared together with the symptoms. Oftener it persists; but even when it does, I frequently find that the symptoms have been relieved, so that the deviation is evidently not the main cause of them, and may be disregarded. But this is by no means true of all cases; non-operative measures often fail, even after prolonged trial; and then I have no hesitation in operating, and now with the assurance that whatever good results are obtained can be due only to operation. And in this regard I may say that my experience differs from that of some other observers for, unlike them, I do not find that correction of the refraction alone suffices to cure any very great proportion of ocular deviations, and I do find that there is quite a respectable percentage of the muscular cases in which neither this correction, nor indeed any treatment except an operation, succeeds in relieving the symptoms.

4. Others declare that the good results of these operations are *due to suggestion*. That this is true in many cases I have no doubt. That it was true in mine I do not believe. I rather took pains to avoid giving my patients the impression that they were going to derive any very great benefit from the operation. I usually told them that in a certain number of cases the procedure is successful; that I could not tell that it was going to be so in theirs, but that I thought it worth trying. In some instances, as in Case VIII, even this qualified statement was withheld, and the results obtained were not expected by either the patient or myself. I should no more think of ascribing the cure to suggestion in these cases than I should in those where the relief of asthenopia and headache is effected by the use of glasses for hyperopia and astigmatism.

"5. Again, it is urged that the operation is more *formidable and gives the patient more inconvenience* than does the condition which it is intended to relieve. But the inconveniences of the operation are in reality slight and the amount of discomfort produced generally inconsiderable. There is practically no pain, and the wounds heal kindly at once. Nor does the operation entail any prolonged disuse of the eyes; on the contrary, the best results are secured by having the patient use his eyes as soon as consistent with the integrity of the new adhesion formed; *i. e.*, within a few days at most.

"6. Another reproach frequently brought against these operations is that the surgeons who do them *multiply them beyond reason*, performing scores of tenotomies and advancements to correct a single deflection. It must be admitted that there is much reason in this objection. Yet, as I myself have observed, such statements are generally found upon impartial examination to be considerably exaggerated, and it frequently happens that several distinct kinds of operations done upon different tendons and to correct distinct deformities, are characterized as repeated operations upon the same tendon. Be that as it may, I am sure from my own observation that we rarely need repeated operations in order to get good results, and that the increase in our diagnostic knowledge and the employment of a proper technique will still further obviate their necessity.

"7. Lastly, it is said that the results, although good temporarily, are *not permanent*. This again contradicts my experience. So far as I have seen, the effect produced by an operation both upon the deviation itself and upon the symptoms, is usually lasting. There are, it is true, not a few exceptions, but these, I believe occur mainly in the cases in which either the wrong sort of operation has been performed, or in which accessory conditions tending to keep up the deviation have not been removed.

"In spite, then, of these various objections my experience leads me to regard the operation as justifiable and useful in quite a large number of cases. If this opinion—which, of course, is not based simply upon the few specimen cases above adduced, but upon many others studied since—is admitted, we may ask in conclusion:

"(a) What may we expect to accomplish by the operation?

"(b) What are the indications for it?

"So far as my observation goes, we may expect by the operation *to relieve the following conditions*:

"1. An obvious disfiguring deflection of the eyes and the often annoying diplopia that such a deflection may give rise to. The term diplopia, I may add, included not only the pronounced form in which the objects appear frankly double, but also the slight intermittent form in which the double images are not distinctly separate, but overlap, and at times are fully united, at times spread apart again. This latter variety of diplopia produces great confusion of sight, particularly in reading, when the slight overlapping of the letters causes the print to look blurred, as though the types had slipped.

"2. Pain in using the eyes and asthenopia; a sense of weariness and strain preventing the patient from using his eyes for very long at a time.

"3. Headache, migraine, and other reflex pains (not infrequently referred to the occiput or spine.)

"4. A sense of constant confusion in the head and of dullness, causing aprosexia and mental hebetude and depression.

"5. Vertigo.

"6. Digestive disturbance, with impairment of appetite and nutrition and subnormal body weight.

"7. Chorea, (rarely).

"It must be borne in mind that the disturbances above enumerated are *not necessarily in proportion to the magnitude of the deviation*. On the contrary, as I have elsewhere pointed out, it is precisely the moderate and small deviations that produce the most troublesome symptoms. The reason for this, no doubt, is that when the deviation is large the patient, finding that he can not possibly correct it fully by muscular effort, simply leaves it uncorrected—lets his eyes go, so to speak, and hence is not burdened with the strain involved in keeping his eyes straight, as he is in the case of a smaller, more corrigible deviation. Another reason is that in many of the cases in which the deviation is apparently small, it is really large, part of it being latent; and, as being latent means being concealed by continuous muscular effort—*i. e.*, continuous strain—such cases, like cases of latent hyperopia, give more trouble than do those in which the deviation is all manifest, and hence obviously large.

"The cases which, in my experience, are apt to cause the most pronounced symptoms are also the ones I have found most amenable to treatment, I refer to cases of moderate vertical deviation (hyperphoria). Only care must be taken not to tenotomize an inferior rectus when the hyperphoria is due to insufficiency of an elevator, or tenotomize a superior rectus when there is insufficiency of a depressor. Cases of esophoria due to excessive convergence are likewise readily relieved (by tenotomy of the interni), provided the accommodative element has been previously eliminated by correction of the hypermetropia and astigmatism.

"On the other hand, an esophoria due to an insufficiency of divergence, or an exophoria due to an insufficiency of convergence (when non-accommodative), while they often give rise to marked trouble, are also very difficult to treat. They require the performance of an advancement, supplemented by exercise with prisms. Cases of exophoria due to excessive divergence do not often give rise to trouble, and are fairly amenable to treatment (by tenotomy of the externi).

"The *indications* for the operation may be thus stated:

"1. The symptoms must be pronounced enough to call for treatment. This, which would seem to be an obvious restriction, is disregarded by some who would correct all deflections of the eyes whenever met with, on the ground that they must lead to trouble sooner or later. But in view of the fact that even well-marked deviations may exist for years without producing any special symptoms, we would prefer to follow the well-understood rule of surgery and leave uncorrected a condition which is causing no disturbance.

"2. The muscular anomaly must be more or less constant in presence and amount.

"3. The symptoms must be directly traceable to the muscular anomaly. To determine this, we must have sought for and, as far as can be, have eliminated other possible causes of the symptoms—that is, we look for and seek to remedy diseases of other organs, we try the effect of tonics and exercise, and we correct the refraction. When by a process of exclusion of this sort we have seemingly narrowed the question down so as to feel confident that the eye muscles are the cause of the symptoms, we may then test our belief by giving a correction with prisms for temporary use. Prisms prescribed for constant wear are hardly ever of much service as a therapeutic measure—indeed, they often do harm if worn too long—but as a means of diagnosis they are of considerable value, since a case which is benefited temporarily by wearing them is *a fortiori* likely to be benefited by an operation.

"4. We must make an acute diagnosis of the nature and cause of the muscular anomaly. To do this we must not rest satisfied with the statement that our patient has so many degrees of esophoria or hyperphoria, but must find out what is the cause of the esophoria or hyperphoria—*e. g.*, whether it is due to insufficiency or overaction of any special muscle, or to underaction or overaction of one of the associated movements of the eyes, or two or more conditions combined.

"5. Our treatment must then be directed to the cause so found. Thus, if we are dealing with an esophoria or convergent deviation, we shall, as has just been pointed out,

treat it in one way if the esophoria mean deficient divergence or insufficiency of one or both externi, and in quite a different way if it means either excessive convergence, *per se*, or excessive action of one or both interni.

"It need hardly be added that an operation in any case must be regulated by the effect to be produced, and hence must be graduated by careful measurements taken before, during and after its performance."

Ametropia and Muscle-Imbalance in Young Children.

GOULD, GEORGE M., Philadelphia. (*The Philadelphia Med. Jour.*, May 21, 1898.) Dr. Gould directs attention to the importance of "detecting at the earliest possible day the existence of defective vision, or imbalance of the ocular muscles," and the necessity of seriously warning parents of the danger of delaying the necessary remedies. He illustrates his statements by adding the histories of a few cases, and submits the following propositions:

"Positive squint, easily recognized by any one, needs immediate expert help to prevent fatal and permanent amblyopia.

"By alternately covering the eyes (the cover-test) the physician may, at a very early date, detect beginning imbalance.

"By bandaging the good eye, and observing if the child can pick up, handle and touch objects accurately, one may prove whether a suspected amblyopia really exists or not.

"The earlier in childhood, even during infant-life, that amblyopia, muscle-imbalance, or high-degree ametropia is discovered the easier the prevention of almost certain and irremediable ocular injury. The child may be too young to wear glasses, and still therapeutic measures may be instituted (temporary mydriasis or blinder for the good eye, for example,) that will prevent injury too great for recovery.

"Glasses, when required, must be ordered much earlier in life than is supposed possible or taught necessary. If I had a child 2 years of age needing them I am sure they would be ordered, and just as sure they would be not only tolerated, but welcomed, and most sure they would prevent great ocular, physical and mental injury."

The writer refers to de Wecker's article in the *Annales d'Oculistique*, January, 1898, entitled "La Proportion des Cas guerissables dans le Strabisme," as indirect confirmation of the views just given.

"Out of 67,622 eye-patients of all kinds there were 3,002 cases of strabismus, and of these the poor patients were proportionately twice as numerous as those of the easy classes. This, of course, means that what little attention is given abroad to the subject of prevention served to lessen the evil of strabismus among the well-to-do one-half, the poor, of course, getting no attention and the well-to-do next to none. De Wecker says that the percentage of alternating strabismus cases represents an equal proportion of curable cases, but that the so-called spontaneous cures occurring at from 12 to 16 years of age are only apparent, binocular vision being scarcely ever re-established. Only the cases of periodic myopic strabismus with preserved acuity of both eyes are the truly curable ones. By 'curable' de Wecker really means not the institution of binocular vision, but only the suppression of deformity; over 50 per cent. of monolateral-strabismus cases are not capable of complete cure. Note the following figures:

CURABLE CASES—I. E., BINOCULAR VISION.

Periodical Myopes,	Periodical Hyperopes.	Permanent Monolateral.	Permanent Alternating.	Total.
161	479	421	269	1,330

INCURABLE—I. E., WITHOUT BINOCULAR VISION.

Periodical Myopes.	Periodical Hyperopes.	Permanent Monolateral.	Total.
42	138	1,492	1,672

"In reference to these statistics there are several questions that arise:

'1. Is it going too far to say that 99 per cent. of these 1,672 incurable cases could have been given binocular vision if proper glasses and proper treatment had been ordered from the earliest possible age? My own feeling

is that the proportion would be found nearer 100 per cent. than 99 per cent.

"2. Even if the percentage is smaller, think of the mental and emotional suffering, entailing an equal or greater amount of physical and worldly pain, up to the time of the cure by operation.

"De Wecker claims the cures are due to the operation; how many of them were in fact due to the glasses undoubtedly applied after the operation? About this aspect of the matter not a word is said.

"How many of the total number, both the curable and the incurable, could have been cured by the glasses without operation?

"5. It is to be noted, also, that de Wecker calls curable cases those with vision greater than one-fourth. Nothing is said as to the percentage of such cases reaching really useful vision of the injured eye. A vision of but one-fourth seems to me to indicate an extremely strabismic charity to the 'curer.'

"6. From another table of de Wecker we find that the numbers and ages at which patients presented themselves were: From 5 to 10 years, 727 cases, and 10 to 20 years, 1,032 cases; but we are not told at what ages the 1,330 curable cases were actually cured by him. There can be little doubt, both from the figures given and from our common experience, that the truly curable were mostly young."

Insufficiency of the Ocular Muscles.

PAYNE, S. M., New York. (*Medical Record*, April 9, 1898.) The writer alludes to a previous paper on this subject in which he attempted to show that "a vertical as well as a horizontal tendency for the eyes to deviate existed when the two eyes differed in refraction, and a horizontal tendency only when the refraction was the same." In the present paper the writer seeks to furnish additional proof of the correctness of this proposition and also to "show that insufficiencies of the oblique muscles are due to a difference in the refraction of the two eyes, and that they cannot be found to exist when the refraction is the same." The histories of thirty-three illustrative cases are given, and also a tabulated report of 514 cases, which seems to support his views,

ABSTRACTS FROM CURRENT SPANISH OPHTHALMIC LITERATURE.

BY A. B. HALE, M. D.,

CHICAGO.

Use of Formal in Various Eye Troubles.

✓ *El Siglo Medico*, Madrid, January 2, 1898, has the report of Dr. Castrasana concerning his use of formal 1:300 to 1:1000 in various eye troubles, especially in sixteen cases of dacryocysto-blenorrhea, of which he cured fourteen. He praises it highly when the drainage into the nose is assured, but is less fond of it under other circumstances.

The Use of Electrolysis in Treating Trachoma.

✓ *La Revista de Medicina y Cirugia Practica*, August 15, 1897, contains the experience of Dr. de las Cuevas y Pulido in the use of electrolysis in treating trachoma. There were five cases in which he gave it a thorough trial. His method was to place the positive pole—sponge or cloth electrode—on the cheek of the side on which was the affected eye, and to use a small needle for the negative pole which was passed several times over the conjunctiva to make a kind of electrical scarification. The strength of current was of six to seven milliamperes used for three or four minutes at a time several days a week.

The author confesses that he resorted to this only as a scientific experiment, and would suggest that others try the same process, but he cannot get much encouragement from his results in these five cases. Only one patient was cured. The others fared indifferently or were even harmed by it. Theoretically there are indications for electrolytic action, and he hopes his failures were due more to faulty method than to improper reasoning. The current was quite painful.

Leucoplasia Bacillais Tuberculosa.

✓ *Gazeta Medica de Mexico*, March 15, 1898, is the presentation of Dr. M. Otero, of what he calls a new disease

—Leucoplasia bacillaris tuberculosa—which he thinks is as
es have been seen they
nown xerosis of the con-

**FELLOWS' COMPOUND SYRUP OF
HYPOPHOSPHITES.**

5, Rue de Ecuries D'Artois,
Paris, France.

Mr. James I. Fellows,

Dear Sir :

I have frequently prescribed your Syrup of Hypophosphites, chiefly in *anæmia* and *debility* consequent upon acute diseases; I have also given it during a long period in a case of *phosphatic diabetes* (Phosphuria). In the majority of cases it has been beneficial, and I have found it an excellent general tonic and stimulant of the appetite.

Yours truly,

L. Munod, M.D.

TUESDAY,
NOVEMBER 7TH, 1899

gave a history of measles
ily base. Both mother
uble. The conjunctival
n's attention—as a fact,
at other symptoms—was
lea, occupying much of
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up, and close inspection
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ds of Leprosy.

, March 15, 1898, Dr. J.
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de la Habana, No. 2,
by Dr. J. Santos Fenan-
bined with cataract and
theses:
ed upon for glaucoma,
nile catract, what ought
will do no good, and

o be done when the cat-
of glaucoma? Ans. Yes.

3. Ought extraction to be done immediately after iri-

dectomy in the glaucomatous eye, or sometime later?
 Ans. Afterward.

4. Ought extraction always to be done? Ans. Wait and study the effects of the preliminary iridectomy.

He narrates a series of cases to prove the wisdom of his conclusions.

Use of the Ophthalmometer.

Gazeta Medica de Mexico, April 1, 1898, has the results obtained by Dr. A. Chacon by the use of the ophthalmometer in measuring 124 corneæ of Mexicans.

The mean corneal radius was 7.62 mm. in the horizontal meridian and 7.45 mm. in the vertical. The mean refraction was estimated to be 44.72 D. (radius being 7.53 mm.) The greatest difference in refraction with the rule was an astigmatism of 5.50 D., and the least, an astigmatism of 0.10. Against the rule the greatest difference was 1.1 D., the least, 0.4 D. In only four cases was there no corneal astigmatism at all. In five cases both eyes were exactly alike, in nine cases very nearly so.

In the 62 patients, 49 had meridians at 90° and 180°, the rest inclined somewhat. Seldom did the result of the ophthalmometer agree with the best refractive result obtainable with glasses.

Causes of Error in Prescribing Spectacle Lenses.

Revista Medica de Mexico, Vol. X, No. 21, April 15, 1898, has an article by Dr. M. Uribe Troncoso (*Mexico Puente de Morozon*, No. 8,) on the causes of error in prescribing spectacle lenses. The investigation was suggested to him by having a patient for whom half a dozen eye men had prescribed as many different glasses, the difference between them all being of merely minor degrees. Troncoso refers to the work of Tsherning, Javal and others, to show that a perfect cornea does not exist, and that a partial neutralization of the astigmatic curvature in the anterior corneal surface of one meridian is affected by the curvature of the posterior corneal surface, but he thinks he has proved as well that partial contractions of the ciliary muscle add a still further neutralization of corneal astigmatism, by the effort to adjust the lenses to the task. To stop this muscular effort, therefore, Uribe advocates the correction of the total astigmatism found by skiascopy, after corroboration with the ophthalmometer and trial lenses.

ABSTRACTS FROM CURRENT GERMAN AND ENGLISH NEUROLOGIC LITERATURE.

BY WENDELL REBER, M.D.

PHILADELPHIA, PA.

For the Quarter Ending June 30, 1898.

The Eye Lesions of Multiple Sclerosis.

In an extended article on the clinical signs, etiology and pathology of multiple sclerosis, Sachs, (*Journal of Nervous Diseases*, May and June, 1898, (attaches no little importance to the ocular symptoms of this disorder as described by Parinaud, Uthoff, Suebbers, Guenther, Nagel, Kunn and Schwarz. The commonest of these signs is nystagmus which, when not marked, can be easily brought out by having the patient rotate the eyes to the extreme lateral positions. True nystagmus occurs, according to Uthoff, in 58 per cent., and according to Marie, in 70 per cent. of all cases of multiple sclerosis.

Uthoff is responsible for the statement that affections of the optic nerve are frequently associated with nystagmus in this disorder, whereas, the latter symptom is apt to occur without such atrophy in other conditions.

Ocular palsies occurred in 3 out of 10 cases that fell under Sachs' observation. The order of frequency is, abducens, oculo-motor and trochlear. Their recurrent character is strongly suggestive of disseminate sclerosis. A complete ophthalmoplegia externa has not been developed in multiple sclerosis.

These palsies are not early like those of tabes, but follow in the wake of the spinal symptoms. Iridoplegia is rare.

Much more characteristic than the preceding signs, however, are the changes in the vision, the visual fields and the optic nerves; and yet the slight diminution in vision is out of all proportion to the alterations in the fields and nerve heads. The finding of numerous small scomata, especially for red and green, scattered throughout the visual

fields, is the strongest presumptive evidence of multiple sclerosis.

While several peculiar changes in the nerve heads have been revealed by the ophthalmoscope, complete atrophy is found to be very rare, (Uthoff found it in but 3 out of 100 cases). Incomplete atrophy occurs in probably 50 per cent. of all cases, and if such atrophy affects only the temporal half of the nerve, it is almost pathognomonic of this spinal disorder. The resemblance of this form of atrophy to that of the toxic amblyopias is always to be borne in mind. It is the more interesting in that multiple sclerosis has been shown to be at times of toxic origin.

The anatomic changes in the nerves are as variable as the functional disturbances. The fact stands out that sclerotic changes in the optic nerves are very much as in other parts of the central nervous system. The optic atrophy of tabes dorsalis is due to primary degeneration of the optic nerve fibers, while in multiple sclerosis the atrophy is the result of an interstitial neuritis and this in turn may be due to a disease in the blood vessels.

Finally, in multiple sclerosis the retinal elements are not affected.

Double Ophthalmoplegia Externa Chronica and Multiple Sclerosis.

In view of the statement which we quote from Dr. Sachs' preceding article on multiple sclerosis that "a complete ophthalmoplegia externa has not been developed in multiple sclerosis," the following case history recently reported by Dr. Peterson, (*Journal of Nervous and Mental Diseases*, May, 1898,) is of no little interest.

W. A. G., a 26-year-old unmarried man, came under observation because of weakness in his legs, and inability to use his right hand in writing. No hereditary taint or neuropathic predisposition. Denies tobacco, alcohol, venery and syphilis. About the 13th year, the movements of the eyes became gradually impaired, although the patient could give no data as to the order of their involvement. He asserts, however, that he never had diplopia, nor had he ever experienced any particular inconvenience in the use of his eyes, save from the drooping of the upper lid. He dates the feeling of general weakness from the time

of onset of the ptosis. All of the extrinsic muscles of both eyes were completely paralyzed, while the intrinsic muscles escaped.

Dr. Carter reported the visual fields as normal. It is rather the rule, at least in the early stages, for the pupillary reactions to remain intact in chronic ophthalmoplegia externa dependent upon dyscrasias or focal lesions, whereas the external muscle of the eye suffers early in tabes and paresis.

"The case above reported presents certain interesting symptoms in addition to the ocular ones, namely, intention tremor, increased reflexes, ankle clonus, slight hesitation in speech and a suggestive dullness of expression, all of which makes a multiple sclerosis more probable than any other palpebral disorder. It seems that sclerosis, with an unusual dissemination of the plaques, would explain all of the symptoms exhibited."

(The argument for multiple sclerosis would have been much strengthened in the above case, had there been found small scotoma for red or green scattered throughout the visual fields. It will often be necessary to resort to 2 and even 1 mm. objects at times to discover these little blind spots in the visual field.—W. R.)

Incomplete Ophthalmoplegia Externa.

WIENER, ALFRED (*Jour. Nerv. and Ment. Dis.*, June, 1898), reports a case similar in some respects to the foregoing, occurring in a 17-year-old male, who three years before had had transient difficulty in speaking one day, followed by severe headache and dizziness. At 4 o'clock the same day he had a third attack, and in trying to observe in a looking-glass what might be wrong with his tongue he noticed that his face was drawn to the left side. A moment later he fell in a convulsion, slept for an hour and awoke perfectly well, save for the ocular anomaly. Denies alcohol, tobacco and syphilis. Family history negative; no rheumatism; heart hypertrophied; no murmurs. Bilateral partial ptosis and vertical diplopia. Following muscles are involved: R. E.—Internal and superior rectus slight; external rectus slight. L. E.—Internal and inferior rectus slight; external rectus slight; superior rectus marked. Pupils react to light and accommodation; eye-grounds, vision, form and color fields normal.

The author inclines to the idea of a vascular lesion in this case, and in considering causative factors rejects the probability of hemorrhage or of an inflammation simulating polio-encephalitis superior.

"The condition of the boy's heart, together with the sudden onset and peculiar involvement of the muscles on both sides, points to the involvement of one of the large branches of the basilar artery. The nature of the lesion in an individual of this age who denies tobacco, alcohol and syphilis, must necessarily be an embolism."

A Case of Functional Ophthalmoplegia Externa.

SACHS, B. (*Jour. Nervous and Mental Diseases*, June, 1898), reports the case of a 51-year-old man, a heavy beer drinker, whose first wife died of a paralytic stroke accompanied with a left ocular palsy (specific?). Six years later he married again, since which time he had led a regular life, enjoying good health up to January 12, 1898, on which day, while at a friend's funeral, he noticed a flash of light before his eyes, began to see double, felt slightly dizzy and was dazzled with the daylight. Soon after both eyelids drooped. Sachs first saw him three weeks later, when there was double ptosis, although the patient did not use his frontalis muscles as do ordinary patients with ptosis when they try to look up. After repeated vigorous commands he raised his eyelids a little bit. When the eyelids were lifted with the finger the visual axes were seen to be somewhat converged. Conjugate movement to the left was imperfect; to the right normal. Vertical movements jerky and somewhat restricted. When the eyes were tried singly it was found that the left external rectus rotated, that eye only about half as far outward as it ought. All other movements were performed satisfactorily, although the excursions were jerky, and were much smoother at some times than at others. The muscles were at all times easily fatigued. Pupils slightly irregular and, although feeble in response to light, reacted promptly to accommodation. Dr. Marple reported the eye-grounds as normal. Although the form fields were contracted, the color fields were normal, nor were there any central scotomata to be found.

V.—O. D. 20/40—with I. 00 D. cy. ax. $90^{\circ}=20/30$.

V. in O. S. 20/40—with I. 00 D. cy. ax. $90^{\circ}=20/30$.

There was no other palsy, nor any ataxia; and the gait, station and reflexes were good. The head was held rigidly toward the right, from an evident desire to avoid the light (*also, possibly to avoid a vertical diplopia.*—W. R.). The only other main symptom was a complete left hemi-analgesia, *excepting the left cornea*, which was sensitive to the touch; in every other part of the left half of the face and body severe pricks with a pin were not felt.

Few changes were observed until hypnotic suggestions were tried, since which time improvement in the ocular conditions has set in.

In commenting on the probable nature of the case Dr. Sachs says:

“In view of the alcoholic and (possibly ?) specific history of the patient, it was natural to think first of an organic lesion; but the sudden origin of the palsies, the unusual variability of the symptoms during a single examination, the incomplete palsy of each muscle affected, the palsy of movement rather than of individual muscles, the preservation of the pupillary reflexes, the normal functioning of the chief muscles supplied by the third nerve in spite of the ptosis, militated against the diagnosis of an organic ophthalmoplegia. Moreover, no organic lesion could possibly account for the photophobia and for the contraction of the visual fields. On the other hand, the sudden onset of the palsy amid emotional excitement, the variability of the symptoms and, above all, the hemi-analgesia, not to mention the improvement under hypnotic suggestion, support the diagnosis of a functional (hysterical) partial ophthalmoplegia.”

(There is something strongly suggestive of the early stages of recurrent oculomotor palsy in this history, if the ptosis was a true ptosis; if it were really a blepharospasm then the picture is almost a complete reproduction of a similar one reported by the editor of this department in the ANNALS for 1896.—W. R.)

Acute Bilateral Retrobulbar Neuritis, with Complete Blindness for One Month. Recovery.

After reviewing the main features of acute retrobulbar neuritis, Higier (*Neurologisches Centralblatt*, May 1, 1898,) details the following history:

"C. L., 38 years old, a commission merchant, noted for the first time on June 5, 1896, headache, with photopsia before the right eye. During the day the headache increased while the vision of both eyes sank rapidly. Three days later (when Higier first saw the case) the patient was almost entirely blind. Extreme rotation of the eyeballs in any direction brought on excruciating pain. Globe sensitive to pressure. No exophthalmus or strabismus; anterior ocular segment normal. Pupils fully and equally dilated and immoveable to light, although the convergence reaction was intact. Estimation of the visual field (in a darkened room) with the hand, showed perception of hand movements in the upper inner field of the left eye. No color sense whatever. The ophthalmoscope showed well defined optic neuritis simulating choked disc in both eyes.

The other symptoms on the part of the nervous system were, facial asymmetry; uvula drawn down to left side; diffuse analgesic patches, and increased patellar tendon reflexes. Urine free of sugar or albumen. No symptoms of lues, tuberculosis, or any chronic intoxication. Infection denied. Smokes moderately; occasionally drinks to excess, and yet is not a habitual imbibitor. No trauma, exposure, hemorrhage or toxemia of any character. Recently much depressed over the sudden death of a son. Patient is of neurotic stock. Treatment, absolute rest, dark room, laxatives, liquid diet, and a mixture of soda salicylas with iodid of potassium. Four days later the symptoms were so much worse, and the patient showed such intolerance to the iodid (and to the mercurialunctions that were tried afterward) that recourse was had to pilocarpin under the skin daily. After the sixth injection, there was a marked change for the better; after the fifteenth injection the patient could walk about the house alone, the pupillary reactions were prompt, and the swelling of the nerve heads had almost entirely disappeared, and seven weeks after the affection began, examination showed visual fields that were normal for form, while a good sized scotoma was found in both eyes. Unfortunately the perimeter could not be used in this examination because of the patient's confinement to the house. Red was the only color that could be distinguished, and that only

by the left eye. Six months later the case was examined by a colleague, who found H. in both eyes of $1/2$ D., pupils normal in reaction, visual fields normal for form and color, no scotomata; muscles normal, eye grounds normal, subnormal color perception. Under the use of strychnin the vision in both eyes rose to normal, color perception was perfect, and visual fields also.

The author states that diagnosis by exclusion compelled the above diagnosis, and offers the following diagnostic rules:

1. Peripheral retrobulbar optic neuritis declares itself by the involvement of the peripheral optic nerve fibres, inducing contraction of the visual field. Only by the use of weakly contrasted objects can this peripheral contraction be shown. The lesion lies in a periostitis at the foramen opticum, wherefrom the affection has been styled "retrobulbar perineuritis" to distinguish it from the "ax-ail" and the "disseminate" varieties. Lead is prominent among the causes of retrobulbar neuritis that may lead to peripheral defects in the visual field.

2. Recurrent optic neuritis is analagous to recurrent polyneuritis and is generally due to a lesion at the optic foramen that is awakened into renewed activity by different stimuli, most frequent among which is an acute cold.

3. The hereditary or family variety of retrobulbar neuritis (Leber) is encountered mainly in adults of the male persuasion, and is generally subacute. It is recognized by the central and paracentral scotomata that are almost invariably present.

4. The optic neuritis seen during the course of polyneuritis must be viewed as a participant in the general process. In one patient in my practice (presumably a case of arsenic poisoning) the optic nerve symptoms preceded the involvement of the general nerves.

5. The optic neuritis of tabes dorsalis occurs very seldom in the sense of a marked inflammatory process. When it does occur it is to be viewed as a complication of the spinal affection, like unto the involvement of the peripheral nerves.

6. The optic neuritis seen in an acute encephalitis appears to depend upon the presence of the same infectious

virus that excites inflammation in the cortex and subcortical ganglia. It is, therefore, not to be looked upon as a form of choked disc, or as a neuritis secondary to inflammation of the sheaths of the optic nerve.

7. The optic neuritis of acute and subacute myelitis is of much greater frequency than is commonly supposed, although its connection with syphilis is not as evident as is often claimed. In three cases that have come under my observation, syphilis was certain in but one. In one of these cases the neuritis was fulminant and coincident with the myelitis. In the second case, the optic nerve symptoms were five or six days in advance of the myelitis; and in the third case, they followed in seven and a half weeks after recovery from the myelitis, affecting one eye at a time. Most of the cases of myelitis can be traced to a heavy cold. Autopsies have repeatedly shown association between inflammation of the peripheral nerves on the one hand and myelitis or myeloencephalitis (spontaneous or experimentally produced) on the other (compare with Landry's paralysis, polyneuritic psychoses, and the myeloneuritis of the French authors). It is further known that dogs that have been experimentally exposed to the cold, have developed both neuritis (Lassar) and myelitis, (Hochhaus) and it seems therefore, pretty well established that the same causative factors underlie certain forms of myelitis and the optic nerve inflammation that accompanies them.

8. The optic neuritis of multiple sclerosis is often not only acute, but also the first symptom of this grave cerebrospinal disorder. The diagnosis rests, not upon the ophthalmoscope, but upon the discovery of small irregular sector-like defects or scotomata scattered throughout the visual field. There is much difference of opinion among authorities as to the pathogenic relations between this (group 8) and the two preceding groups.

9. The optic neuritis which is encountered in Gerlier's disease, and its near Japanese relation, "Kubisagari" forms the last class. Both of these maladies are toxic and infections in nature, and in their clinical features closely similar to Goldflam's "family form of paroxysmal paralyses." Moreover, all of the three approach very closely to true functional poliomyelitis.

NOTES AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest to its readers. Please address Albert B. Hale, M. D., Columbus Memorial Building, 103 State Street, Chicago.)

Dr. Alexander Yust, of Berlin, died May 25, aged 55.

Dr. Robert Tilley, of Chicago, was found dead in his bed the first of June.

The ninth congress of teachers of the blind will be held in Berlin the last week this July.

Dr. M. Peschel has been appointed a. o. professor of ophthalmology to the University at Turin.

The next meeting of the German Ophthalmological Society will be held in Heidelberg, August 4. 1898.

Dr. Frank B. Eaton, of *The Laryngoscope*, has moved from San José, to 704 Sutter street, San Francisco, California.

Prof. Silex (Berlin) has given up his position as assistant in the University, to devote himself more to his just established private clinic.

Dr. Carl Grunert, assistant physician to the eye clinic of ophthalmology of the University. is now established as privat docent in Tübingen.

The International Association of Railway Surgeons met in Toronto, Canada, on July 6, 7, 8, 1898. A large attendance was present.

Prof. Dr. L. Bellarmino a. o. professor of ophthalmology, has been appointed ordinary professor to the Military Medical Academy at St. Petersburg.

A kind hearted and unbusinesslike country doctor for years looked after his spiritual shepherd (and furnished medicine) till the latter's death. The widow, on settling the deceased's estate, wrote to her

dear friend, the doctor, to ask how much he would give her for the empty bottles.

Dr. P. N. K. Schwenk has been elected attending surgeon to Wills Eye Hospital, to fill the vacancy caused by the resignation of Dr. Edward Jackson.

The Maryland Ophthalmological and Otological Society was organized in Baltimore March 29. It will hold meetings on the second Thursday of each month.

Prof. Gruber is to retire from his chair of otology in Vienna, and this will be united with that of Prof. Politzer. No successor will, therefore, be appointed.

Dr. F. C. Hotz has been elected by Rush Medical College, Chicago, to the chair of ophthalmology and otology, made vacant by the resignation of Dr. E. L. Holmes.

The Otto Vohlbruch prize of 9,200 marks has been awarded by the University of Göttingen to Prof. Roentgen of Marburg, for the greatest advance in science during the past two years.

At the Denver meeting of the American Medical Association Dr. Casey Wood, of Chicago, was elected chairman, and Dr. C. H. Williams, of Boston, secretary, of the ophthalmological section.

Dr. August Wassermann, associated with Prof. Robert Koch in the Infectious Diseases Laboratory of the Charité, Berlin, has been titular Professor, largely as a reward for his recent work on the gonococcus.

Dr. D'Rudolfo del Costillo has published in an essay of 220 pages his studies in the history of early Hispano-Roman eye practice, called epigraphia ophthalmologica. He has unearthed many curious things in folk and medical lore.

Of 217,000 prescriptions examined in Chicago, New York, Boston, Washington, Baltimore, Denver, San Francisco, New Orleans and St. Louis, 11.25 per cent. called for proprietary medicines. So says the *International Medical Magazine*.

Snailken says that the Moors are inveterate coffee drinkers, and that most shop keepers may be seen all day long drinking coffee either by themselves or with their customers. As they approach the forties or fifties the sight begins to fail, and many Moors go totally

blind in late middle life. It would be interesting to know whether this is a coffee neuritis, or an accelerated cataract formation, due both to coffee and to the heat and extreme sunlight.

E. Storen states that in over 74 per cent. of several hundred persons examined, the color of the eyes can be traced to inheritance from the grandparent of the same sex on the side of the parent of the opposite sex; boys from their mother's father, and girls from their father's mother.

Good eyesight is not decreasing in Germany in the army. On the contrary, correct statistics furnished by Surgeon General Seggel, show that the proportion of recruits endowed with more than normal power of vision is now 92 per cent., whereas, in 1873, it was not more than 56 per cent.

In a students duel (Mensur) at Tübingen, one of the participants was struck over the eye by his antagonist's rapier with such force as to dislocate the globe from its socket. Vision was afterward lost. Such a trifle, however, will have no tendency to lessen the popularity of the national game.

A newspaper proprietor was recently sued for damages by a medical man, for an error made in printing a testimonial. A simple comma left out made it say: "I now find myself well after being brought to the very gates of death by having taken only three doses of ———— medicine"!

Dr. John P. Davidson, at present house surgeon at the New York Eye and Ear Infirmary, has been elected professor of diseases of the eye, ear, nose and throat in the Medical College of Virginia, of which institution he is a graduate of the class of '93. He succeeds the late Prof. C. M. Shields.

By direction of the Kultus minister (Germany), Prof. Kuhnt, director of the Königsberg University Eye Klinik, has gone to Egypt and Palestine for the purpose of studying there the contagious diseases of the eye. The mission has reference to the increasing prevalence of such diseases, particularly of trachoma in east Prussia.

Prof. Dr. von Michel of Würzburg on May 1, celebrated his 25th year as professor. After several years service as assistant physician to Prof. Homer in Zürich, in 1872, Michel became privat-docent in Leipsic and was shortly afterward called to Erlangen and appointed professor. He began his lectures there in the summer semester of 1873. In 1879, he followed up his work in Würzburg and has continued his teaching and work there ever since. His scien-

tific attainments are so well known that it may be said that there is no ophthalmologist in all the world who has not profited by them. The present and former assistants of Michel have honored him with a testimonial, which was given in the Stuggart School of Industrial Science.

As the inhabitants of Ravenna used to point to Dante and say: "There is the man who has returned from hell!" so the latter-day inhabitants of Bellune, the home of the monogenarian Dr. Pazello, point to him and say: "There is the man whom George Sand loved!" Whether they mean to paraphrase the classic words first quoted, I dare not say.

M. Th. Bolas recently gave at the Society of Designers, London, a lecture and demonstration in glass blowing in which, among other things, he illustrated the making of a complete glass syringe that could be easily sterilized by boiling, and of small tubes for preservation of medicine or of the application of medicines by drops—a device that could be made particularly serviceable in applying medicine to the eye.

A corn is not a disease, according to a late decree of an official German inquiry board; and consequently a corn doctor is not a medicine doctor. Whether bad treatment which results in a diseased condition can be fathered upon the chiropodist, is not yet settled. Perhaps this explains the reluctance of corns to yield to christian science. I was recently told by an enthusiast in the faith that the cure of a corn was the last test of infallibility.

The British army is being sorely perplexed by the number of rejections taking place in its ranks, on account of imperfect eyesight. Whether the medical examining board is becoming overstrict, or whether visual acuity among young English speaking recruits is becoming lower, is not yet decided; but many army people are advocating the use of spectacles on Tommy Atkins to improve his seeing, and to make him in more ways than one, the equivalent of the German soldier.

The brilliant and learned editor of the *Philadelphia Medical Journal* is so generally correct in his statements and so directly accurate in his conclusions, and I am so indebted to him for constantly received favors, that I know he will understand me in opposing a late statement of his, that all diagnoses should be written in terse Anglo-Saxon instead of a (bastard) dog Latin. Stopping in my argument against such a dictum only long enough to say that a member of the learned (sic) medical profession ought to know enough Latin and Greek to write a correct Latin diagnostic phrase, I must give it as

my own conviction that a formal *Latin* diagnosis is always the best. It has a world-wide recognition; it is read by the Brazilian, the Greek, or the Japanese, and it submits to orderly classification in an index. Iritis is always iritis—Regenbogenhautsentszündung may or may not be discoverable. I need not go further, but I will gladly meet the editor in the controversial arena, should he wish a wider argument.

The colors of gems are not permanent in light. The reason for this is difficult, for although chemical reactions on solid bodies have been proved, the same is not demonstrable in stones. A ruby which had been left for two years in a light show window, was found to be considerably lighter after this time had elapsed, than a stone previously of exactly the same color which had been kept in the dark. Similar results occurred with emeralds, sapphires, garnets and topazs, and pearls are notoriously changable.

Otto Becker, who died eight years ago at the age of 62, while in the midst of his activity at Heidelberg, ought not to be forgotten in the university and hospital for which he had done so much. Of course his pupils and colleagues can never forget him, but in order to perpetuate his memory in a more material way, it is proposed to place a tablet in the modest house in Ratzeburg, where he was born, and a bust of the master in the hospital at Heidelberg, which for twenty-two years was the home of his activity. All friends of ophthalmology are invited to contribute. Prof. Evensbusch, Erlangen, accepts funds.

Ramon y Cajal has made out that the cones are to be considered from the histogenic standpoint as a more highly developed form of the retinal rods. This works to the favor of those theories of the sensation of light which regards the color sense of the cones as being the result of a gradual development, and of the achromatic sensation furnished by the rods. According to some observers, the cones in the periphery of the retina resemble the rods very much in appearance. If it can be made out that in the dichromatic retinal zone (the zone in which the reds and greens are not perceived) there is an intermediate form of conè (the form with only a few basilar threads, for instance) that would also be a fact of much theoretical importance.

Among other things, Saxony is famous as being the headquarters for quackery. Five districts there have more quacks than doctors. Of 745, there were 582 men and 163 women; 220 were nature healers; barbers, weavers, knitters, shoemakers, nurses, carpenters, show the rank from which they graduated. In Döbehn (I know the town

well) regular medicine is called quackery by their advertisements (quite American), and cure-alls freely extended. One enterprising *fin de siècle* specialist treats all diseases by the Roentgen ray or by transillumination, claiming to detect and to overcome pathological processes by lowering his lamp into the stomach or other cavity and letting the current shine through. Some of the sick-fund societies even employ such quacks, and the head of one large factory employing many work-people, actually recommends a nature doctor to his hands.

The third volume of Norris and Oliver's "System of Diseases of the Eye" is being distributed to the subscribers. A full review of this admirable section of the work will appear in the October number of the *ANNALS*.

American medical science, especially ophthalmology, is to be congratulated that it is ambitious in all things. Surely it must be proud of the undertaking of Louis Stricker, M. D., of the Cincinnati College of Medicine and Surgery, from whom I have just received an advanced prospectus of his forthcoming work on *The Crystalline Lens System*, its embryology, anatomy, physiological chemistry, physiology, pathology, diseases, treatment, operations and after-changes, with a consideration of aphakia. Dr. Stricker plans to have this supercede the less modern works of Becker (*Pathologie und Therapie des Linsensystem*) and Graefe-Saemisch (*Zur Anatomie der gesunden und kranken Linse*.) I hope every encouragement possible will be given Dr. Stricker in this arduous task, and I suggest, as his letter requests, that the best aid he can find will be an advance subscription.

Tobacco smoking is delightfully handled in an editorial remark in a recent issue of the *Philadelphia Medical Journal*. The critic concludes his critique by answering the question, "How about cigarettes"? with "but I am talking of tobacco." This is a splendid compliment to nose and throat men. and to ophthalmologists as well. No one knows better than we the awful consequences to our special organs of an indulgence in the occidental weed, and for that reason I find that most eye and throat men have of late avoided tobacco and taken to cigarette smoking. At a recent banquet of medical men I took pains to note the narcotic habits of the eye and throat men present, and I am proud to narrate that four-fifths of them refused cigars, and at a sacrifice of their own comfort, I have no doubt, manfully persisted in smoking cigarettes all evening.

On February 16, Dr. S. Pozzi operated on Mlle. Sarah Bernhardt for an intra-ligamentous tumor. I don't know what this may have to do with ophthalmology, but I insert the notice in the *ANNALS* be-

cause I have seen it for the last month in every kind of medical publication, and I must not appear to be behind my contemporaries in advertising methods. Besides, by adding thus to the publicity, I may be able to ascertain from some better informed reader, how such news was given to the press. Of course, Dr. Pozzi can not be guilty, for we know what sticklers the French are for etiquette, and newspaper notices are by us considered quite unethical. Modesty (sic) would of course forbid the patient's confidence to the expectant world; or can it be that her particular tumor was such a delicate one that it did not suffice to say simply that such an operation was done—its very source had to be given. But I am confused. I think we might take more lessons of our foreign confrères.

BOOK NOTICES.

OPHTHALMIC OPERATIONS.

CZERMAK, WILHELM, Prag. (*Die Augenärztlichen Operationen.* 11th and 12th parts; 15 illustrations. Carl Gerold's Son, Wien, 1898.)

The previous parts of Czermak's book have been favorably reviewed by the editor, who again voices his appreciation of this most admirable work. Parts 11 and 12 embrace pp. 685 to 812, completing description of operations upon the sclera and dealing with operations upon the iris; excision and trepanation, galvano-cautery and suturing of the sclera are described. The various operations upon the iris, iridectomy and like procedures, iridectomy, operations upon cysts of the iris, posterior corelysis, removal of iris prolapse and removal of foreign bodies with all their modifications, are given at length. A few words of a defective nomenclature have been allowed to creep in, for instance, v. Wecker's "Iritoectomie" and "Iritodialyse." The proper root is *Irid*.

The black and white illustrations are simply perfect, type and paper good. The work is most exhaustive and all known operations are therein to be found included. It is not only valuable for reference, but the large amount of space and full description given to each operation is such as to render it really necessary for the progressive ophthalmologist.

H. V. W.

ON THE VALUE OF THERAPEUTICS IN TRACHOMA.

RAEHLMANN, E., Dorpat. (*Ueber den Heilwerth der Therapie bei Trachom.* Fischer's med. Buchhandlung, Berlin, 1898.)

R., from his large experience, divides treatment of trachoma into three divisions. 1. Medical treatment. 2. Surgical treatment. 3. Therapy of the complications and resulting conditions. He speaks of the various operations that have been recommended at different times and that they have not been fully satisfactory, but all have their respective adherents. Silver nitrat and copper sulphat hold a meritorious place in the medical treatment. The indication for silver nitrat is in the muco-purulent stage when the mucous membrane is soft and in the chemotic stage when the purulent secretion is excessive. Copper sulphat is used when the mucous membrane is swollen and tense and the secretion seromucous. In new cases the solid stick is used; in old cases and in the scar-forming stage, copper solution and salve are better. Lead acetat is only used in follicular conjunctivitis and is essentially an astringent while silver is corrosive; copper sulphat being between the two. In the last stages none of the three are of much use, antiseptics as sublimat are of especial importance.

The surgical treatment considerably shortens the disease, but the result cannot be counted upon, and often only shows how much the eye can stand. Restoration of the mucous membrane to its normal function is the end aimed at, and must always be born in mind in the treatment. The tendency of the follicles is to become confluent and ulcerate. In puncturing and squeezing out of the follicles or expression by the roller forceps, too much force must not be used and the surgical treatment must go hand in hand with the copper sulphat, which, when applied early enough, checks the disease process and is the only rational treatment. Brossage and scarification are not highly recommended. Treatment of complications takes up half the brochure, pannus being considered as a separate condition in the treatment of which the medical is to be preferred to operative procedures. He recommends the use of a $\frac{1}{10}$ per cent. solution of scopolamin four times a day. In rare cases of deep pannus he resorts to Scarpa's periotomy. No success has been obtained by the use of sublimat or salt injection. Massage of cornea with sublimat of yellow oxid salve is highly recommended. Also iodoform and iodid salve are used. Entropion, trichiasis and distichiasis can only be remedied by operative treatment, and only then when the result obtained relieves the globe from contact with the cilia. Transplantation of mucous membrane and skin has given success.

The most common cause of blindness in trachoma is trichiasis and is found in the second stage (follicular destruction in 30 per cent. of cases) and is caused by cicatrization in half the cases. Epilation of hairs is only palliative. They can be removed by galvanocautery or electrolysis, the latter of which is painful. Removal of tarsus is not a modern method. Transplantation of skin gives rise to lanugo which irritates the lower lid. The author recommends excision of the ciliary bearing tissue and replacement with mucous membrane, preserving the normal cilia and glands. After transplantation, the commissure is closed and dusted with iodol or airol, or boracic salve is smeared on the edges and occlusive bandage applied. H. V. W.

REPORT UPON THE 25TH MEETING OF THE HEIDELBERG OPHTHALMOLOGICAL SOCIETY.

V. HIPPEL AND WAGENMANN. Edited by Hess and Lever. (*Bericht über die 26te. Versammlung der Ophthalmologischen Gesellschaft Heidelberg, 1897.* 295 pp., 13 plates and 9 illustrations in the text. Printed by J. F. Bergmann, Wiesbaden, 1897. Price 6 marks, (\$1.75.)

This book contains the 27 papers and 7 demonstration-reports, delivered at the meeting of the Ophthalmological Society of Heidelberg, August 5 to 7, 1897. Of particular interest are Kruckmann's Pathogenesis of Choked Disc, which attacks the inflammatory theory of v. Leber and divides cases of choked disc into those of functional disturbance and those of true papillitis in which there are severe anatomic changes. v. Hippel describes the Eye of the New-born; Leber, Band-like Corneal Opacities; Bach, Ocular Muscles Paralysis;

Bernheimer, Innervation of the Ocular Muscles; Bielschowsky, Monocular Diplopia without Physical Findings; Weiss, in his paper upon Strabismus, finds visual field defect in a considerable proportion of cases; Darier gives a New Method of Operation for Ptosis by Muscle Transplantation; Baas, The Anatomic Foundation for Ring Scotoma; Schirmer, The Function of the So-called Pre-reticular Cells of the Retina; Wagenmann, Circulatory Disturbances; Axenfeld, What do we Understand by Phlyctenular Eye Inflammation?, shows that in addition to the scrofulous diathesis there is also an infection of the conjunctiva and cornea with staphylococci, largely due to infection from the edge of the eyelids; v. Hippel, Congenital Hydrophthalmus; Sattler, Operative Treatment of Congenital Ectopia Lentis; Leber recommends the Treatment of Gonorrheal Conjunctivitis in the Adult by Kalt's Method, of large irrigations with weak solutions of hypermanganat of kalium.

In the list of 360 members, two dozen American names are to be noticed.

H. V. W.

TECHNIQUE OF OPHTHALMIC SURGERY.

TERSON, A., Paris. (*Technique Ophthalmologique: Anesthésie, Antisepsie, et instruments de chirurgie.* 206 pp. J. B. Baillière & Son, Paris, 1898.)

This volume is the outgrowth of a series of lectures on ophthalmic technique, delivered by the author at Hotel Dieu, as chief of M. Panas' clinic: hence, the work may be said to reflect the views of both these Frenchmen. The subject is arranged under the three following principal headings: 1. Anesthesia in Ophthalmic Surgery. 2. Antisepsis in Ophthalmic Surgery. 3. Instrumental Technique.

For general anesthesia Terson gives the preference to chloroform, avoiding its dangers by administering it in very small doses, frequently repeated. General anesthesia is to be reserved for such operations as extensive blepharoplasty, extirpation, enucleation, orbital tumors, most lacrimal operations, and for all but the slightest operations in children.

The remaining operations about the eye can be done with entire satisfaction under cocaine, by instillation or subconjunctival injection, assisted frequently by the conjoint use of extract of suprarenal capsules. The latter remedy is also valued by the author in the treatment of vascular keratitis, anterior sclero-choroiditis, iritis, and other affections of the anterior ocular segment, with the exception of corneal ulcer.

Terson prefers 2½ per cent. solution of cocaine to 5 per cent., because of the desquamative effect of the latter on the corneal epithelium. In tenotomy, and especially in advancement, he uses 10 drops of cocaine (1 per cent.) under the conjunctiva, claiming for it brilliant results and absolute freedom from any danger, although he has noticed much wider dilatation of the pupils after cocaine used in this way than after ordinary instillation. The aqueous solution of

the suprarenal extract (used after the cocain injection) is a part of the preparation for every tenotomy or advancement.

The author goes through the whole list of local anesthetics, viz: strophanthine, erythrophleine, tropo-cocain, ouabine, eucain and holocäin, and concludes by saying that cocain is the only one that enjoys his full confidence. He uses it in aqueous solution, also in glycerin and oily solutions. The only advantage of the latter is the absence of any effect on the corneal epithelium. He believes that aqueous solutions can be sterilized by heating them to 200° (centigrade) without destroying the activity of the cocain, provided ebullition in the solution is not permitted. (Our own experience has been that cocain solutions which have been carried near to the boiling point without reaching ebullition, have always lost their anesthetic properties.)

Great stress is laid by the author upon the sterilization of all instruments, to the neglect of which the unexplainable percentage of failures of many of the oldest surgeons is attributed. Terson prefers boiling water to all antiseptic solutions, and warns against hot boric acid solution, because of the crystals of boric acid that are almost sure to be left on the instrument somewhere. All dressings are to be sterilized by dry heat.

In the general preparation of the patient salol, with its intestinal antiseptics is considered quite as good as sweeping out the bowels with laxatives. Strict attention to the adnexa, lid borders, and nasal chambers (including the lacrimal duct) is urged.

As for the conjunctival sac, Terson does not say whether he does or does not believe that the sac can be sterilized. His fondness for pre- and post-operative irrigation of the sac with biniodid of mercury solution 1:2000 would indicate a doubt as to its possibility. The biniodid solution must be of body temperature and at least 200 grams (7 ozs.) should be used at one time.

A chapter on the principal operations on the globe, with a description of the instruments needed, closes what is as interesting a monograph as has appeared in ophthalmology in a long time. It is an admirable guide to the surgeon, the assistant, the student and the nurse, as to the means whereby the greatest success in ophthalmic surgery may be attained.

REBER.

"CIRCULATION IN THE NERVOUS SYSTEM."

By. Dr. Wm. Browning, Brooklyn. Among the works from the press of the J. B. Lippincott Company, comes to us a volume entitled "The Normal and Pathological Circulation in the Central Nervous System," a series of original studies by Dr. William Browning. It is composed of a collection of neurological papers read before different societies during the past few months, is well printed and of convenient library size. The book contains eighteen headings such as, Examination of spinal efferents for cerebro-spinal fluid; chemical identification of the same; foramen speno-temporal in man; the veins of the brain of a monkey; experimental determination of the method of development of symmetrical brain hem

orrhage; lumbar puncture for removal of cerebro-spinal fluid; apoplexies of the brain, etc.

There are several good plates showing the supracerebral and coelian veins of the brain, one indicating the speno-temporal emissary in the monkey, and another outlining the cranial fissure and depression in the case of old traumatic cephalhydrocele.

Hemorrhage of the brain is treated in a comprehensive manner, and while rather too concise for ordinary purposes, contains many practical points seldom touched upon by current literature. The post-mortem condition of the ventricles and the brain tissues in the different cases are carefully described and to the specialist are valuable, inasmuch as they open new paths to the study of the cranial circulation. The description of the operative procedure under treatment of hydrocephalous is brilliant, and while unfortunately not satisfactory in results, serves to point out the road to complete success.

Original research in any field of medicine or science is necessarily a laborious and painstaking task, and we welcome additions to the ranks of such investigators.

For the neurologist and oculist these papers will hold great interest, both from the fact of their careful details and the scientific manner in which they are reported. To the ordinary practitioner they will not be of as much value. The volume is rich in suggestive thought and replete with valuable data.

HEBERTON.

**HOW TO USE A TRIAL CASE OF LENSES FOR THE PROPER
ADJUSTMENT OF GLASSES TO DEFECTIVE REFLECTION.**

By W. McCaw, M. D., author of the correspondence course of theoretical and applied optics in the Geneva School of Refraction, Geneva, N. Y., 1898. Price \$2.50.

I saw this book advertised in a well known eastern medical journal, with a column of such laudatory criticism that I felt a lack on my library shelves. "An ideal guide-book," "perfect results for any one who is giving special attention to the study of optics." "The chapter on prisms quite complete," etc. I confess that I am sometimes afraid of the scientific competition of opticians and of the ease with which I hear they fit glasses where others fail, so that if such a book, written for them, could teach me the trick, I wanted it. Was it unprofessional of me, I wonder? At any rate I wrote to the publishers (Geneva Optical Company) and received with a courteous letter by return mail, the book for review in the *ANNALS*.

I will say this much, that the book is well bound, printed on good paper with good type, and furnished with plenty of wood cuts, some of them numbered, some not. But beyond this I cannot go, and I must assert that the claims made in the advertisement are in no respect justified. Look at the literary style, for instance! On page 6, O. S. is said to mean ocular septimus. "Mediums" is used for media. On page 48, "if the curve--are correct." Or the scientific expression page 9, the axis of a lens is called "the axis of power or cone of the lens;" on page 10, convex lenses are said to "increase

the angular magnitude; concave lenses to decrease the angular magnitude," without in the least explaining what this means. On page 14, in explaining Fig. 10, it is said that L is a "bi-convex lens with its cone or axis at 0." "All lenses have a central plane spot called the axis." But I need quote no more. It is evident that the author knows nothing about optics or how to discuss the subject.

To work by rule of thumb is often a very practical way. Undoubtedly many good results have been lost to the world by the lack in a scientific mind of the capacity of working by rule of thumb; yet such rules given without adequate explanation, without an attempt to explain first principles are, in such a book as this, worse than misleading; they are disastrous. The author gives eighteen rules for adjusting glasses and measuring muscular anomalies. Rule I, for instance, dealing with the first examination, says that "whatever lens (either + or -) gives the best vision * * * will be an indication of what lens the patient is going to need." No explanation of the terms myopia, hypermetropia, etc., and not until page 44, is there a word about accommodation. Here it is stated that "a considerable degree of hypermetropia or *myopia* (italics mine) can be, and is overcome by the power of accommodation." "To determine it accurately is the work of the oculist only. When a four grain to the ounce solution of atropin is instilled into each eye, after seven meals or more, that has the effect of relaxing the ciliary muscle * * * " Pshaw! I can pick out errors till midnight. The book isn't worth waste paper. I could write a better one myself. If the publisher wants my copy back he may have it. A. B. H

KUHNT'S TREATMENT OF TRACHOMA.

Kuhnt, Dr. Med. Hermann. Prof. der Augenheilkunde in Königsberg. Über die Therapie der Conjunctivitis granulosa (therapy of granular conjunctivitis (trachoma.)) Jena Verlag von Gustav Fischer, 1897. Price 4 marks.

I think I may reasonably claim that I see annually as many cases of trachoma as any one man in Chicago; and, therefore, when Prof. Kuhnt did me the honor to send his work on the subject, the result of his many years activity in the home of trachoma, I was flattered personally, and I rejoiced scientifically that I might yet find some better means than I had hitherto employed to combat the chronic granulations, which are such a blight to eye and eyesight.

Prof. Kuhnt is a dualist, but he deprecates the attempt to draw a sharp diagnostic line between granules and follicles; in many cases he thinks that time alone can differentiate between the malignant and benignant growths. Such fairness as this is well accompanied by an honest pessimism concerning the results of any one method of treatment for all cases, or concerning all methods—short of radical operations—so long as the patient must or does remain within the territory saturated with trachomatous poison. In fact, Kuhnt iterates and reiterates this theme, that patients treated away from

a saturated territory (East Prussia, for instance,) may get well by any plan of treatment, and that no treatment which does not include the knife can be trusted within this territory.

The history of trachoma, its symptomatology acute or chronic, its pathology and its early treatment are but lightly touched,,so that most of the 171 pages are devoted to the radical and only trustworthy regimen of attack.

One interesting, and to me new, phase of the study is the close association that Kuhnt draws between the granules of the conjunctiva and those of the nasal mucous membrane; he even admits the probability of infection through—sometimes limited to—the nose. Very commendable, too, is the care with which all the patients' external conditions must be controlled before the disease can be mastered. For this reason Kuhnt's treatment begins by overcoming any blepharospasm, distortion of lids, or disease of the lacrymal passages. In the last instance I have been pleased at his advocacy of radical extirpation of the tear sac (an operation I learned at Kiel), as one of the surest ways of hastening a cure of deep-seated trachoma. The trichiasis operations are almost all mentioned and illustrated, although I am sorry to find no mention of Hotz's plan for entropium, an operation certainly well known and liked in Germany.

The treatment of trachoma he divides into medical, mechanical and surgical, including the combined methods that depend upon any modifications; most plans of treatment he adopts when indicated, but it is Kuhnt's opinion, based upon a long experience in Koenigsberg, that every method must yield to the purely surgical. He is a firm believer in excision of the fornix (retrotarsal folds). This pleases me, because in my book (translation of Ficks' Ophthalmology,) the operation is commended, but one reviewer seems horrified at the thought, and pitied me that I tolerated such barbarism! Kuhnt introduces a new operation, the excision of the tarsus with retention of the conjunction; for this he claims a great future.

The book is a delight from beginning to end, and I know not which to admire more, the thoroughness, fairness and completeness, both literary and scientific, or the honesty which impels him after so much experience to be so skeptical of treatment as such, and with which, on the other hand, he advocates rigid government control of infected areas, so as to kill off the cause; while on the other hand he distrusts salves and washes alone, and is content with nothing short of extirpation when once the disease has gained a foothold.

Of the press work I can say nothing. It is characterized by the good qualities that are a mark of Fischer's publications.

A. B. H.

GLAUCOMA; ITS SYMPTOMS, VARIETIES, PATHOLOGY AND TREATMENT

By Alex. W. Stirling, M. D., C. M. (Edin.); Member of the Ophthalmological Society of the United Kingdom, Atlanta, Ga. Illustrated with microphotographs. 177 pp. Jones H. Parker, St. Louis, Publisher. \$1.50.

As set forth in the preface, the contents of this book were put together partly in connection with lectures given by the author to the students of the New York Post Graduate Medical School, and in part as a contribution to the *ANNALS OF OPHTHALMOLOGY*, in which it was published serially during 1896-97.

American monographs on ophthalmic subjects, furnishing evidence of original research, are so extremely rare that Dr. Stirling's performance calls for something more than a passing mention. Although it partakes largely of a compend, it is something more than a purvey of other men's goods. The mass of glaucoma literature, relatively large even in Graefe's days, has grown to such proportions in our own times that even a much larger volume than the one we are considering would hardly contain bare outlines of the matter contained in the various articles, addresses, monographs and original theses that have from month to month claimed our attention. That the author has been able to declare his preference for this hypothesis over that one, for this particular theory over the other, or has decided in favor of one of many methods of treatment argues that he has spent a vast amount of study and exhibited great diligence in making himself familiar with at least the literary portion of his task. In indicating the various authorities whose works Dr. Stirling utilizes he has found it necessary to make 593 distinct references, that are scattered through the fifteen chapters that make up this admirable monograph. With regard to these it may be said, briefly, that they include almost every valuable observation on the subject of glaucoma that has so far appeared in the glaucoma literature of all countries.

Of much more importance, perhaps, is the account given by the author of his original investigations of the choroidal changes and of the alterations in the *venae vorticosae* (pursued under the advice and guidance of Mr. Treacher Collins,) in this disease.

The vortex veins of 20 eyes enucleated for primary glaucoma were examined. The number of the vortex veins in 11 normal eyes was in one case 4, in three cases 5, and in seven cases 6, giving an average of 5.5, and they had a close relation to the recti muscles, being generally near but very rarely beneath them. In the tabular statement of the condition of the choroid and veins it will be seen that in 11 of the 20 eyes the choroid showed inflammatory patches, and that nothing abnormal was found in connection with the vortex veins except in three of the eyes examined. The choroidal inflammation always consisted of small but distinct aggregations of cells between the vessels, but not in the vessels themselves, not limited to any particular layer of the tissues, and never so running into one another as to give rise to the appearance of a change affecting

it throughout. In no case was the lumen of any choroidal vessel seen to be diminished by exudation pressing on it from without. The following is a short description of the pathological changes in the vortex veins of the eyes above referred to: No. 13 shows a slight inflammation round the vein at its choroidal extremity. In this eye, as in some others examined, there were patches of inflammation in the ciliary body. No. 14 shows an inflamed patch in the wall and perivascular sheath of the vortex vein in the sclerotic, and the vein is partially filled by blood-clot composed chiefly of red cells; in the wall of a vein just external to the sclerotic and close to the vortex vein (so that it might be a continuation of the latter,) is a markedly inflamed patch. Inflamed patches are also found in the choroid and ciliary body. No. 16 shows patches of inflammation in the vein wall and perivascular sheath, and in the choroid: then in the lumen of the main vessel, but not in its wall, and not in any of the vessels of the choroid, are circular bodies taken on strongly the hæmatoxylon nuclear stain. They are about one-fourth the size of a nucleus, give a bright reflex from the center, and are situated in patches in the red blood-clot which occupies part of the lumen of the vessel. What these bodies are I am not at present prepared to say: they may, perhaps, be some form of parasite, but are too large for any of the known cocci, and what they may signify I have been unable to discover."

The theory of the causal relation of gout to glaucomatous processes, so ably advocated by Richey of Washington, was, as Dr. Stirling shows, sustained as early as 1842 by Siehel, who strongly recommended the constitutional treatment of the disease. In 1854, also, Mackenzie remarks that the Germans consider glaucoma to be essentially a podagra of the choroid.

Chapters XI and XII on simple glaucoma are, perhaps, the most valuable in the whole treatise, and the difficulties of diagnosis are discussed at considerable length. The author evidently does not agree *in toto* with Schweigger's definition of the disease, as he has seen in the University Eye Clinic of Berlin several cases there diagnosed as optic atrophy, which he would be inclined to regard as glaucomatous. He pertinently concludes with the sentence:

"Whatever may be our belief concerning the etiology of simple glaucoma, the fact remains that practical surgeons occasionally meet with cases which they find difficult of diagnosis, and an important question arises: Is there any known means by which the two diseases can be definitely separated?"

The subject of "posterior glaucoma," the division of the subject first proposed by Desmarres and assented to later by de Wecker and Stirling, is thoroughly discussed on pages 49, 50 and 70.

Finally, attention should be drawn to the effectual manner in which the voluminous literature touching glaucoma in its relations to accommodative stain, the retention *versus* the hypersecretion theory, the method by which cure is obtained, the causes of operative failure, etc., has been utilized.

A valuable and complete index makes it possible to refer to almost any subject connected with glaucomatous affections.

C. A. W.

ANNALS
OF
OPHTHALMOLOGY.

VOL. VII.

OCTOBER, 1898.

No. 4.

SOME CASES OF TOXIC AMBLYOPIA, THREE OF
WHICH SHOW PARTIAL REVERSAL OF THE
COLOR FIELDS.

BY M. W. ZIMMERMAN, M. D.,

OPHTHALMIC SURGEON TO THE GERMANTOWN AND ST. CHRISTOPHER'S
HOSPITALS, PHILADELPHIA.

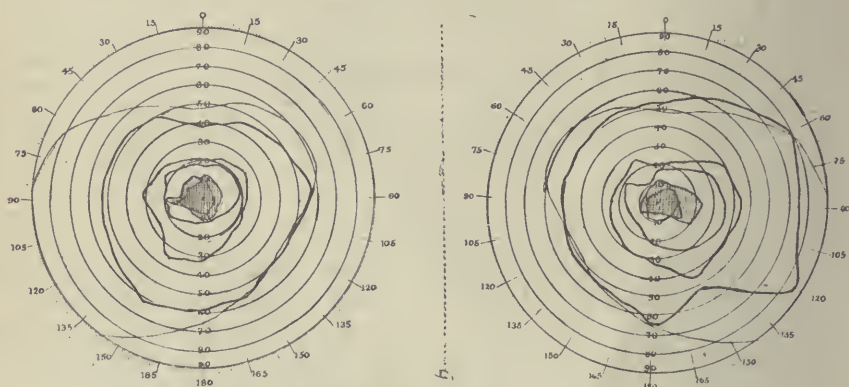
ILLUSTRATED.

The following cases exhibit the central color scotomas of toxic amblyopia in more or less characteristic forms. The fields show various stages from that early one in which the defect is for one color only, to the other in which, after extension of the color blind area to the limit of color perception, there has been "breaking through" and a gradual decrease until only a small crescent shaped islet remains. I have seen no instance of severe permanent atrophic change.

In the accompanying charts the colors retain their normal order unless otherwise indicated by broken lines. In several fields the blue limits are not given. Scotomas for red are indicated by horizontal shading lines, and those for green by vertical lines. There were no absolute defects. The first case, I had the pleasure of studying in the service of Dr. A. D. Hall at Wills' Hospital, while acting as his assistant.

CASE I. J. D., a clerk, aged 30, reported to me in April, 1893, that slight dimness of vision with mild headache, had first appeared eight months previously. Vision had

grown steadily worse and at the time of his visit to me it was reduced to 6/60 in both eyes, and he was unable to read or continue his occupation. His general physical condition and personal history were good. No serious illness since childhood, and he denied syphilitic infection. His work had never required exposure to any of the poisons, and there was no congenital color blindness. For twenty years he had smoked an average of two ounces of common pipe tobacco daily, besides chewing almost constantly. He had always used spirits freely, and during the few months preceding the onset of visual symptoms he consumed half a pint of whiskey and a dozen glasses of



Left.

Field I and II

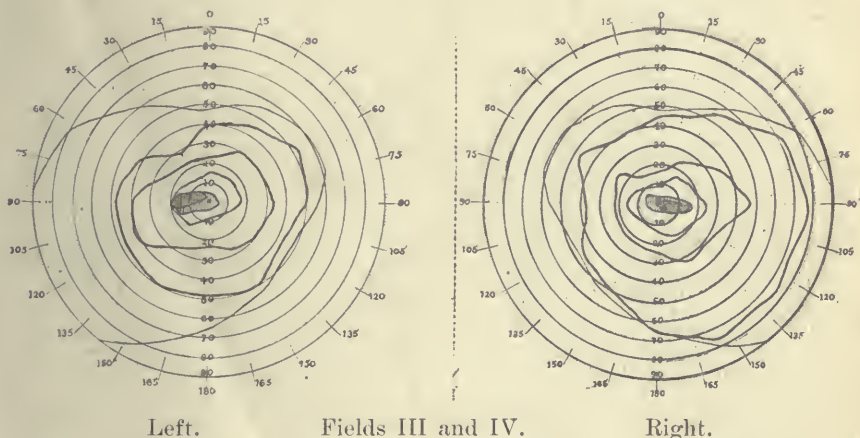
Right.

beer daily. Careful scrutiny of the eye-grounds on several occasions, failed to find palor of any portion of the optic nerves, or other evidence of pathological change.

The above perimetric fields taken at this time show quite large scotomas for red and green of the alcoholic type, with contraction for form and colors in a fairly regular manner, most marked in the left eye. The colors retained their normal order throughout both fields. A simple hypermetropia of 1.25 D was corrected, although the gain in vision was slight. Abrupt stoppage of the intoxicants was found to be impossible, but very rapid reduction combined with strychnia and iodide of potassium gave good results for a time. Several weeks later all symptoms were greatly improved and the patient refused

further treatment. I have never been able to secure a reexamination.

CASE II. J. B., a bookkeeper, aged 38, first consulted me in May, 1893. Specific infection was denied, and the personal history was good. He had fairly good vision until within six months of this visit. The indistinctness then noticed had increased until he was unable to read any but very large type. He complained of slight frontal pain each morning on first facing daylight. He admitted having used tobacco since boyhood, often twenty cigars each day, but recently not so many. His daily allowance of whiskey had been from five to twenty-five drinks. The ophthalmoscope showed a hypermetropia of 1 D., per-

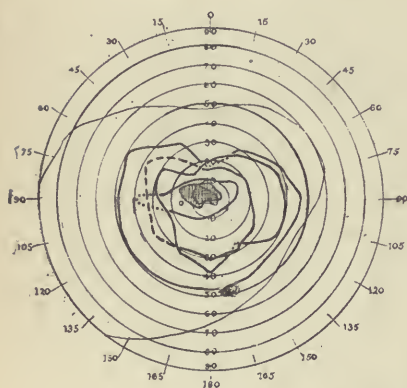


fectly clear media, and no alterations in the color or marginal distinctness of the nerves. Slight palor of the temporal portions might not have been recognized, as a large physiological cup occupying this position interfered with delicate comparisons.

Perimetric charts taken at this time are here shown. The form fields are somewhat contracted, especially in the left eye, but the limits for red and green are normal as to extent and sequence. The scotomas are of the paracentral type, and much alike in the two eyes. The treatment was similar to that of the preceding case, and in one month had improved vision from 5/60 in each eye to 5/20. One year later his wife reported that owing to some viola-

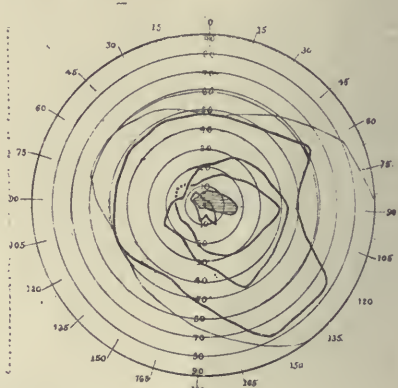
tion of the law he had been confined in a reformatory institution. The enforced breaking up of his old habits had resulted in a complete cure, although he refused me an opportunity to verify this.

CASE III. W. H., a merchant, aged 40, first saw me in June, 1894. His general health was exceptional, and the personal history without important incident. He had been conscious of slightly reduced vision in the right eye for fifteen years, but had never worn glasses. Recent failure of vision dated back six months and had been progressive. At this time $V = 6/15$ in the right eye, and $6/12$ in the left. There was an unimportant acute conjunctivitis. The patient's description of his habits varied with each



Left.

Fields V and VI.



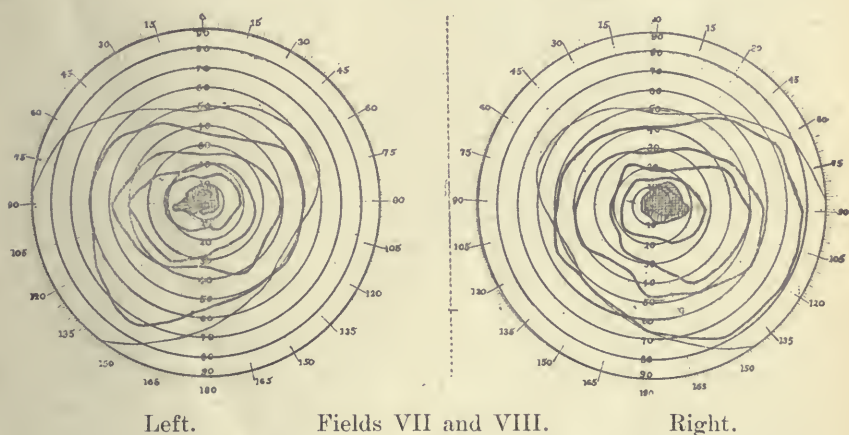
Right.

interview, but he admitted using ten cigarettes and from four to eight pipes daily. He averaged five large drinks of whiskey, probably more, each day. Correction of a small error of refraction did not improve vision. The media were clear. There was moderate hyperemic haze about the nerve margins, and the retinal vessels were very small, but no other changes existed in the fundi.

The fields show contraction for form and colors. In the left the usual order of the colors is distributed in an unusual manner although there is no complete "reversal." The right field presents one point where for a few degrees red is perceived more peripherally than blue. The scotomas are of the paracentral or horizontal type with some pecu-

liarities. The normal blind spot of the left eye is not included in the color scotoma, while in the right eye the defect is for red only. The patient gave a vague account of having always had faulty perception of green. After treating the conjunctivitis and furnishing glasses which corrected his optical error, the patient was allowed travel in Europe under the care of a competent attendant. This course was selected because it offered the only chance to break up undesirable associations at home. Six months of abstinence and medication resulted in very great improvement, amounting to a return of his eyes to usefulness.

CASE IV. E. B., aged 34, came to me in November,



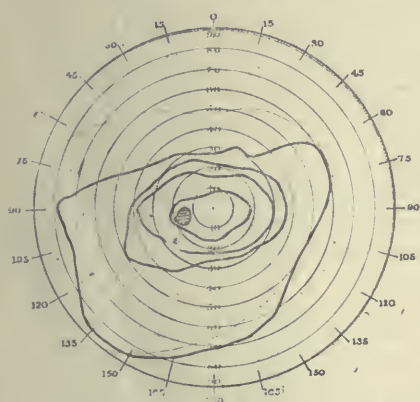
1895. He had worked in stocking and cordage mills, but never among metals or dyes. Worked for a very brief time as a house painter many years ago, but was usually employed as a common day laborer. No grave illness since childhood until two years ago, when he had a severe attack of epidemic influenza, with a similar but milder attack a few months later. He had been married eleven years. There are four healthy, living children. His wife miscarried once four years ago, without known cause. The patient began chewing tobacco at the age of ten years, and continued until August last, after the vision had become seriously impaired, although the amount so used seems to have been small. He had smoked for

seventeen years, recently seven or eight pipes daily, and he estimates the weekly consumption of smoking tobacco to have been about eight ounces, in addition to occasional cigars. Spirits had been taken before breakfast for two months only, but during fifteen years there had been an average of four drinks of whiskey daily, with occasional periods of marked excess. During the previous April he began to notice a mist before his eyes, but no pain. In July his condition was diagnosed at one of the city hospitals, and treatment ordered. The character of the treatment is not known, but it was persisted in for but a short time. On November eighth, at the time of my examination, vision was reduced to 1/60 in both eyes, with all reading impossible.

These fields were taken one day later, and show characteristic pericentral scotomas for red and green, slight regular contraction of all limits, but with no reversal of the colors at any point. The eye-grounds were entirely negative, and no temporal pallor of the nerve could be found. After two weeks of treatment the patient disappeared, and inquiry through the family physician failed to locate him for further observation.

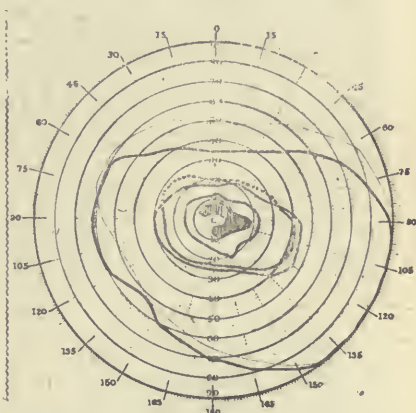
CASE V. T. F., a dissipated-looking man, aged 38, without regular occupation, who spent his life about low drinking places with almost unlimited opportunities for indulging a taste for alcoholic drink. His medical history was vague, but probably unimportant. The onset of visual symptoms had not been carefully noted but serious impairment was of a very few months duration. Persistent pains in and behind the eyes for four weeks only. There had been excessive use of alcohol and tobacco for many years. The amount consumed was estimated by the patient to have ranged from between five and nine drinks of whiskey with numerous glasses of beer each day. He smoked from fifteen to twenty pipes of ordinary tobacco during the same period. The correction of a low refraction error made no change in his vision, which at this time was 6/XVIII in the right eye and 6/IX + in the left. There was blurring of the nerve edge on the nasal side in both eyes, and some difference in the tint of the two halves, the temporal being slightly paler.

The perimetric charts recorded at this time are quite interesting. Both eyes have an almost circular defect for red which includes the blind spot. The right field presents a curious scotoma for green which includes the blind spot



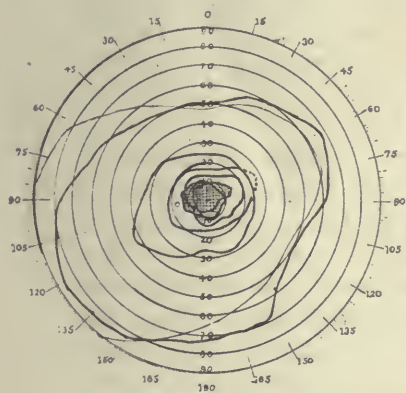
Left.

Fields IX and X.



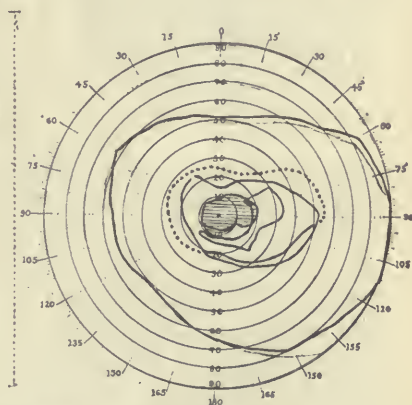
Right.

and extends to the median line below, and much beyond this above. The fixation point is not involved, and the defect has a shape not unlike that of a lobster's claw. The



Left.

Fields XI and XII.



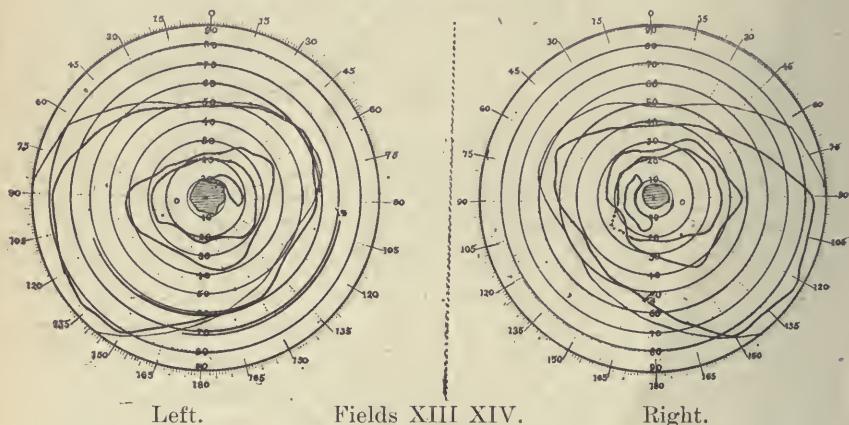
Right.

limit of form perception in this eye is normal, but for colors it is much contracted. Partial reversal of the usual order also existed; the limit for red extending beyond that for blue for about one-third of the field above. Five months later the patient confessed that treatment and ad-

vice had not been followed, while vision had become so bad that his eyes were useless.

New fields taken at this time show larger central defects of a more conventional type: The reversal of colors in the right eye had increased to two-thirds of the circumference, and a similar condition existed for a few degrees only, in the left eye. The last observation was made one month later, when in spite of carelessness in treatment the vision had risen to 6/18 ? in the right eye, and 6/12 in the left.

CASE VI. J. W., a retired merchant, aged 54, was referred to me by his family physician in February, 1897. First and only presbyopic glasses five years previously,



and these had given satisfaction. Three years before I saw him he had fallen on the ice, striking the occiput, but with no serious consequences. Within a few months of this accident, vision began to fail, and an oculist who was consulted at the time, is reported to have diagnosed disease of the optic nerves directly due to the fall. The patient admits smoking 8 to 12 cigars, and drinking 8 to 12 tablespoonfuls of whiskey daily. His appearance and the neighborhood gossip would indicate a larger consumption of alcohol. Correction of a moderate hypermetropia gave vision of 20/40 + in the right eye and 20/30 ? in the left. The media were entirely clear and there was no change in the fundi beyond a very moderate degree of pallor affecting the temporal halves of the nerve-head, the same posi-

tion being occupied by large physiological excavations.

The above fields were taken five days later, and show concentric contraction for colors, and to a less degree for form. In each there is a moderate round scotoma for red, exactly central. Ability to recognize green had been lost to such a degree that only in a small crescent shaped islet near the fixation point of each eye was it seen at all. Even here the intensity of the color was much reduced. Suitable advice and treatment were given to be carried out under the direction of his family physician, who later reported some improvement in habits and vision.

These are all cases of mixed intoxication and it would be impossible from the histories to divide them into groups based upon a preponderance of either agent. While the scotomas vary considerably, there are typical instances of the pericentral form, believed by Hirschberg, to indicate alcohol as the only or most potent poison, and two instances of the paracentral or tobacco type. The slight weight possessed by so small a group of cases must then be cast against the theory of a constant difference in the character of visual defect, based upon the superior or sole activity of one or the other drug. The scotomas are usually described as occurring for both red and green and published charts rarely record the two colors separately. This is perhaps clinically unimportant, but I believe it rarely happens that such defects are alike in form and extent for two colors.

Contraction of the fields, at least for form, has usually been considered absent, but all of the above cases show some peripheral loss, and the form fields are notably reduced in four eyes.

Considerable importance has recently been attached, especially by French observers, to partial or complete reversal of the normal order in which colors are observed at the periphery of the visual field, and it has been suggested that this phenomenon exists only in the presence of hysteria. de Schweinitze has a brief chapter on the occurrence of this symptom in connection with undoubted central scotoma, and refers to G. Goinon's papers on toxic hysteria. Three of the cases reported above (III., V. and VI.) show partial reversal. Usually it is red which for a

considerable distance is distinctly perceived beyond the limit for blue in the same eye.

In the right eye of case III. the usual order is completely disturbed, but no instance of absolute reversal occurred. A very good example of the occasional permanence and progressive character of this curious symptom is offered by Case V., in which subsequent fields taken after a lapse of six months show an increase in the extent of this deviation in the eye originally involved, and the beginning of a similar condition in the fellow eye. Other important symptoms of hysteria may, I think, be excluded, although my examinations could not be made sufficiently thorough to exclude cutaneous anesthesia, etc. The undoubted general nervousness which existed at times, may reasonably be explained by the recent excesses of the patient. The potent influence of suggestion was very carefully guarded against in making these observations.

The most important feature of treatment is total abstinence, abrupt if possible. For a time, depending on the patient's condition, profuse sweating may be induced at regular intervals by Turkish baths, or the hypodermic exhibition of pilocarpin hydrochlorate. Strychnia hypodermically or by the mouth, mercury and potassium iodide are the most valuable drugs. The success of treatment depends very largely on the degree of control which can be exercised over the patient. In my experience this has often been very imperfect except with intelligent men in private practice. With hearty co-operation, however, a good prognosis is usually justifiable and relapses are very rare.

BUPHTHALMIA; AN INTERESTING SERIES OF
CASES OCCURRING IN THE
SAME FAMILY.*

BY WALTER B. JOHNSON, M. D.,

PATERSON, N. J.

ILLUSTRATED.

The terms megalophthalmos, hydrophthalmia and buphtalmia seem to have been used to designate ocular conditions more or less similar. Lexicographers in defining the application of the terms are somewhat confusing, their definitions taken conjointly render a scientific classification difficult. The series of cases here reported, and termed buphtalmia, may be described as: An abnormal general enlargement of the eyeball, as compared to the size of the head or body, a condition occurring congenitally or in infancy, not the result of intrauterine inflammatory disease, but probably akin to glaucoma in the adult.

The development of the disease in three children of the same family is suggestive of the existence of some possible underlying family tendency for the production of this condition, which could not, however, be practically demonstrated. The results attained in the cases in which early operation was performed are most gratifying, and emphasize the necessity for immediate operative interference in such cases.

The family history, as detailed by the father, J. F., is as follows, so far as he knows: No member of his own, nor of his wife's family ever had any form of eye disease, except himself. When he was about 7 years of age his parents first noticed that he had some disease affecting the left eye, with which he was unable to discern objects or light. He does not believe that he ever had any vision in the eye, nor can he recall any time when he suffered

*Read before the July, 1898, meeting of the American Ophthalmological Society.

from inflammatory disease. Upon examination the left pupil is found to be dilated, and does not react to light. Occupying about three-quarters of its area is a calcareous, partially disintegrated lens; there are some pigment deposits upon it, indicating possible old inflammatory trouble; there is no increase of tension.

R. E. V. = 20/20.

L. E. V. = no perception of light.

He and his wife are each strong and healthy; all of their children are and always have been robust. He was 18 and his wife 21 years of age when married. The first three children, two boys and a girl, were not affected by any disease or physical defect.

CASE I.—Six and one-half years after marriage another female child was born J. F. When 2 months old the parents first noticed that the eyes were increasing in size and lacrymation was constant and profuse; the corneæ were becoming hazy. A physician was consulted, who prescribed drops and an eye-wash, which the parents continued to use for two years. During all this time the symptoms became more marked, the eyeballs increased in size, the corneæ became whiter and the eye-sight poorer. The child was then taken to Naples, to Santa Annellio Hospital, for the purpose of consulting Prof. de Vincentiis. She was admitted to the hospital and an operation performed at once—probably sclerotomy. The child remained about twenty days. After this time the eyeball did not increase in size disproportionately to the normal growth of the body. The corneal opacity decreased. There was, however, no appreciable improvement in the vision, which has since that time remained about the same. The father thinks that both eyes were operated upon.

The patient, now 7 years of age, is well developed, has no physical deformity, has never had any disease or sickness of any kind, except measles, which she contracted when a baby.

The eyeballs, as shown in the accompanying photograph, are enormously enlarged and about equal in size. There is more or less constant nictation; the tension is increased to about + 1. The corneæ are somewhat hazy, their area very much increased, the arc very irregular, the

diameter slightly less in the right than in the left eye. It is in the horizontal meridian one-half inch, in the vertical five-eighths of an inch; the anterior chamber is of about the usual depth. The right eye has a scar at the limbus of the cornea superiorally, the pupil is contracted and adherent to the anterior capsule, the lens is cataractous.



Case No. 1.

The left eye shows a moderate dilatation of the pupil, which is very sluggish in its response to light.

R. E. V. = no perception of light.

L. E. V. = fingers at 2'.

In ophthalmoscopic examination the right eye field cannot be illuminated. The left eye has fairly clear media, the fundus is clearly visible, the retinal vessels are decreased in size, the optic disc is bluish-white and considerably cupped. The eye-ground is otherwise normal in appearance.

CASE NO. II.—M. F., female, 2 years of age. When an infant about 1 month old her parents, having been previously warned to be observant in case of the birth of future children, in consequence of the danger of delay, noticed that she had trouble with her eyes, which were increasing in size and intolerant of light, frequently lacrimating, and the corneæ becoming slightly hazy. When two months old, she was taken to Naples to consult Prof. de Vincentiis, who operated the day following her arrival at the hospital Santa Annellio upon the right eye, which the father be-

lieves was larger than the left. He performed an iridectomy, and upon the left eye probably a sclerotomy..

The child presented for examination is strong and healthy, as shown in the accompanying photograph. The right eye is larger than the left, the corneal area is increased and its outline slightly irregular; there is no haziness; the anterior chamber is of normal depth; there is slight increase of tension in the right eye; in the left eye the tension is normal.

The right eye, upon which the iridectomy was performed, now has a large leucoma at the limbus of the cornea, superiorally and to the nasal side, at the point of incision. The iris is incarcerated and the pupil distorted; it is responsive to light. The left eye presents no indication of



Case No. 2.

the performance of any operation.

The father thinks that her vision is good. She is active and seems to be able to see fairly well, but will not permit satisfactory examination; cries and closes her eyes. Fleeting view of the fundus can be obtained, and there has apparently been a retino-choroidal inflammation, as indicated by a large area of degeneration below the region of the macula; the remainder of the eye-ground is normal in appearance; the disc is slightly white, but shows no cupping.

CASE III.—Baby F., a well developed female child, was first examined in November last at the Paterson Eye and Ear Infirmary, the parents believing that she was devel-

oping the condition which had appeared in her older sisters. At that time there was apparently but little trouble, and sulphate of eserin grains one-quarter, to the ounce was instilled three times a day.

The patient was kept under observation during the next two months, and although the development of the disease was gradual it was constant. The eyeballs increased in size, the right eye being decidedly larger than the left. The cornea became hazy, the pupils were slightly dilated, and responded sluggishly to light. The anterior chamber was somewhat shallow; there was lacrymation and intolerance of light; the tension of the eyeballs was increased and eyeballs plus two. The haziness of the cor-



Case No. 3. (Before Operation.)

nea and the extreme restlessness of the child under examination rendered impossible to obtain a satisfactory ophthalmoscopic picture of the fundus. An operation was advised and performed on January 6th, 1898, about two months after the first visit to the infirmary. The photograph was taken on the day before operation.

The patient was etherized and a double iridectomy was made superiorally. In each instance the iris prolapsed upon the removal of the knife, and was excised, leaving a satisfactory coloboma. She was extremely restless after the operation; it was almost impossible to keep the bandages adjusted, except by confining the hands and arms by pinning a sheet about the body. She did well,

however; there was but slight reaction. The wound in the right eye healed without incident; in the left eye, on the third day, the cut edges of the iris prolapsed and became incarcerated, distorting the pupil. The patient remained in the hospital for nearly a month.

July 12th, 1898, the parents were requested to bring the child for examination. They stated that she now has no trouble; the lacrymation has ceased, except on exposure to bright sun light. The eyes have not increased in size, and they believe that she is now all right and can see well. The photograph was taken on this date.

Upon examination the eyeballs appear to have stopped their abnormal development, the corneæ are clear, the ten-



Case No. 3. (After Operation.)

sion is about normal, and the pupils responsive to light. In the right eye there is a perfectly satisfactory coloboma, in the left eye there is a darkened scar at the limbus of the cornea; at the point of incision the iris is incarcerated and the pupil distorted; both pupils are responsive to light. The ophthalmoscopic examination is not entirely satisfactory, occasional glimpses of the fundus seem to indicate the absence of disease, the vessels, eye-ground and nerve appear to be normal. The progression of the ocular growth is abated, and all of the indications seem to forecast future useful vision.

ON THE POSITION OF THE EYEBALL DURING THE LISTING ROTATION AS COMPARED ON THE ONE HAND WITH THE SUCCESSIVE POSITIONS OF A VERTICAL PLANE PASSING THROUGH THE RESPECTIVE LINE OF SIGHT, AND ON THE OTHER WITH THE SUCCESSIVE POSITIONS OF THE PLANE OF SIGHT; THESE TWO PLANES CHANGING THEIR POSITIONS IN THE EYEBALL AS THE PARTICULAR LISTING ROTATION PROCEEDS, AND THIS CHANGE EXPLAINING THE APPARENT INCONSISTENCY BETWEEN THE DONDERS INCLINATION AND THE HELMOLTZ ROTATION.*

By G. HAY, M. D.,

BOSTON, MASS.

ILLUSTRATED.

In the familiar after-image experiment in which the eye in the primary position looks at a vertical line on a wall which is at right angles to the line of sight and after a few moments without changing the position of the head looks up and out, and the after-image appears inclined outward; we have to do with, first, a great circle fixed in the globe, the primary vertical meridian, which, for the sake of simplifying, even if not quite correctly, yet by way of approximation, we may regard as containing the retinal linear image and carrying it from a primary to a secondary position; second, we come into relation with, or we may suppose, another great circle, not fixed in the globe, though always passing vertically through the line of sight, and cutting the wall in a vertical line. The plane of this last circle might be called the secondary vertical plane.

Likewise for the horizontal line on the wall we have to deal with a great circle fixed in the globe, Helmholtz's Netzhauthorizont, and also with a great circle not fixed in

*Presented at the July, 1898, meeting of the American Ophthalmological Society.

the globe, but which passes through the line of sight, and the plane of which cuts the wall referred to in a horizontal line; this plane being the plane of sight.

It is the relations of these great circles to each other which concern us; for it is the relation of the prime vertical meridian to the vertical plane passing through the line of sight which is the basis of the Donders Inclination and it is the relation of the Netzhauthorizont to the plane of sight which constitutes the Helmholtz rotation.

We have thus presented to our notice three factors: 1st, certain great circles in a globe; 2d, their intersections with a plane outside the globe; 3d, the physiological after-image. For the apparent position of the after-image we must take into account the first two factors, the circles and where they cut the outside plane; but for the question of the rotation of the globe about the line of sight, it is sufficient in the case before us to consider certain great circles in the globe; the consideration of their intersections with a plane outside the globe involves an additional element, the position of the outside plane, and complicates the question; in other words, the consideration of the apparent position of the after-image does not simplify but rather complicates the question of the rotation of the globe about the line of sight.

It is proposed to show that the movements with which we are concerned, involve beside the actual rotation of the globe about a fixed (Listing) axis, fixed as to the globe and as to the orbit, also rotations of two specially defined great circles with reference to two other great circles also specially defined, the latter being fixed in the globe, while the former change their position as regards the globe; and accordingly we may speak of the globe as having *relative* rotations as regards these moving great circles. But we do not have a rotation of the globe as a whole about the line of sight.

The Listing rotation makes the line of sight rotate in a plane at right angles to a fixed axis and does not involve any rotation about the line of sight. According to Poincot's parallelogram of rotations, a rotation cannot be decomposed into two others, the axis of one of which is at right angles to that of the rotation to be decomposed.

with the cornea, that is, nearly the middle of the cornea.

Let H be a pole of the great circle EVE, so that

$$HE = HE, = HO = HV = HP = 90^\circ.$$

If we take V to be the middle of the semicircular arc EVE, then

$$VE = VE, = VH = 90^\circ, \text{ and } V \text{ is a pole of great circle EHE.}$$

The diameter EE, is supposed horizontal and to pass through the centres of rotation of the two eyes.

If now the plane of EHE, is horizontal, the plane of HV is vertical, and HV will represent a vertical great circle passing through the primary line of sight, and is called the primary vertical meridian. Its plane is regarded as fixed with reference to the globe.

Likewise EHE, which is perpendicular at H to HV, is conceived as a fixed line as regards the surface of the globe and its plane is what Helmholtz calls the *Netzhauthorizont*. With regard to this last plane it may, by way of anticipation, be stated that it is the angle between it and the plane of sight (the plane of the lines of sight of the two eyes), that Helmholtz calls the angle of rotation of the eye about the line of sight. (See *Physiolog. Optik*, 2d Edition, p. 618.)

These two planes, that of the primary vertical meridian and that of the *Netzhauthorizont*, being conceived as fixed with reference to the sphere do not change their mutual inclination however the eye may be moved.

This leads to the consideration of two other planes or great circles which are not fixed in the globe and in reference to which the *Netzhauthorizont* and the primary vertical plane have *relative* rotations. These planes are the plane of sight EME, and the vertical plane VMJ passing through the line of sight. This last might be called for brevity the secondary vertical plane.

To help us to see the relations of position of the above mentioned planes or great circles during the Listing rotation, suppose a rotation of the globe about its diameter passing through O. Let this diameter be fixed in the globe and in the orbit, and the latter be fixed with reference to the room occupied.

Let O be the pole of great circle arc HP. The great

circle HP is fixed in the globe and during the supposed rotation coincides with a plane perpendicular to the fixed axis and fixed in the room occupied; H will move in the latter fixed plane and in an arc coinciding with the great circle arc HP. Suppose H to move to M by the rotation mentioned.

To facilitate the conception of this change of position, we may suppose duplicate stationary arcs coinciding with those of the diagram. The letter V may then designate a fixed point of the duplicate stationary arc, with which point as the Listing rotation proceeds, different points of the moving surface will successively coincide. Likewise as regards the letters E, and P.

Let Mv represent the place of the primary vertical meridian after H is moved to M, let MN represent the Netzhauthorizont after H is moved to M. These two arcs make an angle of 90° with each other as they did when M was at H, or as in the primary position of the eye.

Let E and E' be points of the surface of the globe through which passes the straight line connecting the centres of rotation of the two eyes. EME, convex toward the reader, is in the plane of sight for the position of the line of sight (of the right eye), passing through M. Great circle VMJ is in a vertical plane passing through the line of sight. It is to be noticed that the letter V, though indicating a fixed point on the duplicate stationary arc EVE' indicates different points on the surface for different stages of the Listing rotation.

The arc VMJ changes its position in space for a movement of M along HP by rotation of the globe about the diameter through O; also changes its position on the surface of the globe, rotating around the moving point M, and away from MP.

Likewise the arc EM changes its position in space as M moves along arc HP, and also changes its position on the surface, rotating around the moving point M and away from MP.

The relations of this paragraph and of the preceding may be seen on a globe by pasting narrow strips of paper on the surface so as to represent the arcs ME and MV for a certain position of M.

Each of these arcs ME and MV make a greater angle with MP as M moves toward P, and therefore angle EMV becomes larger, or angle VME, becomes smaller as M moves toward P.

To show on the diagram that the ang. PMV becomes larger as M moves toward P, consider the spherical triangular PMV, which is right angled at P. We have by spherical trigonometry,

$$\text{tang. VMP} = \frac{\text{tang. PV}}{\sin. PM},$$

from which appears that as PM is smaller, ang. PMV is larger.

Likewise for the angle PME.

As EM and VJ are rotating with reference to each other about the moving M, we cannot infer from the relation of the prime vertical meridian to VJ what its relation is to EM, until we know how EM is rotating with reference to VJ. Or because the prime vertical meridian for line of sight through M tilts out at its upper part from VJ that does not tell us what angle it makes with EME.

Now EM is rotated in such a way that the prime vertical meridian, when the line of sight passes through M, makes an acute angle with ME, the angle opening toward the reader's right or toward a supposed patient's left, and the arc of the Nethauthorizont passes from M to the reader's right and below the arc EME, and this relation is in accordance with Helmholtz's statement.

That there is a relative rotation in the direction stated by Helmholtz may, for a position of the axis of the Listing rotation similar to that indicated in the diagram be shown on a globe, with assistance of some narrow strips of brass tape which may serve as subsidiary great circle arcs. Also it is shown for an inclination of the axis of 45° to the vertical in a communication published in the Transactions of the Am. Ophth. Society for 1868, and in general for any position of the Listing axis, both the Donders inclination and the Helmholtz rotation may be shown as follows:

If on the diagram we consider the spherical triangle VMP which is rightangled at P, we have

$$\begin{aligned} \text{tang. VMP} &= \frac{\text{tang. VP}}{\sin. MP}, \\ \text{tang. VMP} &> \text{tang. VP.} \end{aligned}$$

Now PV is the measure of the angle PHV, and in the movements of the particular Listing rotation, the angle VHP remains constant and is equal to the angle vMP. Therefore angle VMP \geq ang. vMP.

The corresponding relation of the two arcs Mv and MV is the essential basis of the Donders Inclination, as the plane of MV is vertical.

Likewise we shall find that the ang. EMP is greater than the ang. N'MP, and this shows that the arcs MN and ME, are related to each other as they should be in order to conform to Helmholtz's statement as to the direction of his (relative) rotation.

These two conditions will appear consistent if we consider that ang. vMN = 90° = constant, while ang. VME, which in the primary position of the eye, was a right angle, is now acute, having become smaller as H moves toward P.

We have thus seen that there is a *relative* rotation of the Netzhauthorizont about the line of sight with respect to the moving plane of sight and in the direction stated by Helmholtz. But on the other hand it appears from the preceding considerations that there is also a *relative* rotation of the prime vertical meridian plane about the line of sight and with reference to the moving vertical plane VMJ in the direction toward the reader's left, the opposite of that of the preceding relative rotation, as the ang. vMV becomes greater as M moves toward P, ang. vMP being constant and ang. PMV becoming greater as M moves toward P. These two *relative* rotations, though at first they might appear inconsistent, yet coexist and are explained by the angular relations mentioned above which make it apparent, that in comparison with the respective positions for the primary position of the eye, the prime vertical meridian Mv is relatively rotated to the reader's left with regard to the moving arc MV, but to the reader's right with regard to the moving arc ME.

The case might be stated as follows:

The Donders proposition is based on the comparison of the relative positions of the prime vertical meridian and the secondary vertical plane in a secondary position of the eye as compared with their relative positions in the

primary position of the eye; and this comparison shows a *relative* rotation of the globe to the right.

The Helmholtz proposition is based on the comparison of the relative positions of the Netzhauthorizont and the plane of sight in a secondary position of the eye as compared with their relative positions in the primary position of the eye; and this comparison shows a *relative* rotation of the globe to the left.

Now bearing in mind that there is no real rotation about the line of sight during a Listing rotation proper, these *relative* rotations in opposite directions simply mean real rotations of moving arcs or great circles in opposite directions; that is, the secondary vertical plane is moving away from the prime vertical meridian and the plane of sight is moving toward the prime vertical meridian, or the plane of sight is moving away from the Netzhauthorizont and the secondary vertical plane is moving toward it, so that the primary vertical meridian has *relative* rotations in different directions according as we compare its position with that of the secondary vertical plane or with that of the plane of sight.

The angles which the great circles referred to make with each other are not the same as those of their intersections with the plane perpendicular to the primary line of sight, or as it might be called for brevity, the plane of projection. For instance, the plane of HP is fixed in the globe and coincides with a plane fixed in the orbit. But the successive secondary vertical planes, though changing their inclination with this fixed plane coinciding with the plane HP, yet all are represented on the plane of projection by vertical lines; also, the successive planes of sight, though changing their inclination to the same fixed plane, are all represented by horizontal lines on the plane of projection. Moreover the two great circles fixed in the globe, that of the prime vertical meridian and the Netzhauthorizont are represented on the plane of projection by oblique lines, this suggesting rotations of the globe, but apparently inconsistent with each other, relatively to two fixed directions, those of horizontal and vertical lines, which latter, however, really represent planes not fixed but rotating. Thus the appearances on the plane of projection

do not of themselves, without proper interpretations, show the real conditions of the arcs on the globe. They depend not simply on positions of the great circles, but also upon location of the plane of projection, a plane outside the globe.

If we undertake to decide the question of rotation about the line of sight by referring to the afterimages on the plane perpendicular to the primary line of sight, the answer is ambiguous, not decisive.

If we should undertake to decide it by comparing the positions of those portions of the arcs passing through M which are near to M with the positions of the corresponding portions passing through H, we may refer the positions of both of these sets to that of the plane HP, which is fixed in the globe and in the orbit. If there were a rotation about the line of sight, then the arc Mv, which is fixed in the globe, would change its angle with the fixed plane HP. But this it does not do, as both Mv and HP are fixed on the surface of the globe. Or we might say the plane HP is fixed in the orbit; or coincides with a plane which is fixed in the orbit so that we cannot suppose it to rotate about the line of sight. Therefore in the case before us there is no rotation of the globe about the line of sight.

The inclination of the prime vertical meridian outward as shown by the apparent position of the afterimage in the familiar experiment may be explained, without supposing a rotation of the globe as a whole about the line of sight, by the relative positions of the prime vertical meridian and the secondary vertical plane in the globe, the former having a relative rotation outward with reference to the latter, and by the fact that the latter cuts the plane of projection in a vertical line.

Suppose when the eye is in a primary position, a linear image is received at the macula where the primary vertical meridian intersects the retina, and that the eye is then moved upward and outward. Assuming that the after image is mentally projected outward and along the line of sight and located where the primary vertical plane intersects the plane of projection it would be inclined at its upper part outward, as it actually appears.

TWO CASES OF PREMATURE DELIVERY TO
PRESERVE SIGHT.*

BY A. E. ADAMS, M. D.,

NEWBURGH, N. Y.

Mrs. ———, aged 23, a primipara, pregnant seven months, consulted me April 17, 1895.

Her mother died of Bright's disease.

She said she had no headache worth mentioning, and no swelling of the feet or limbs. The only symptom complained of was a gradual but rapid failure of sight for the past two weeks. Her physician had, in a routine way, examined the urine and told her he found no albumen in it.

The R. V. was $4/200$ and L. V. $3/200$. There was a neuro-retinitis in each eye, and the nerve heads were badly swollen (3.50 to 4 D.). The veins were full and tortuous. There were a few glistening white spots in the region of the maculæ, and several large plaques in other portions of the fundii—no hemorrhages.

I wrote a letter to the family physician, stating the condition of the eyes, and that there was no question in my mind about the cause of the trouble, even if no albumen had been found in the urine on one previous examination.

As this case resided in an adjoining county I did not see her again until April 22d, when I found the optic neuritis more marked, the retinitis about the same, and several small fan-shaped hemorrhages. The sight had failed perceptibly. The R. V. was $3/200$ and L. V. $1/200$. Dr. Gordon, who had seen the case since my previous examination, reported that he had found albumen and casts in the urine.

After due consideration of the condition of the nerves, the character of the exudation, the appearance of hemor-

*Read before the July, 1898, meeting of the American Ophthalmological Society.

rhages, the probable viability of the child, and the rapid onset of the trouble, I advised premature delivery if there was any more failure of vision.

On April 27th I received a letter from the patient's sister; she wrote:—

“My sister is now (52 hours after the birth of her baby,) sleeping peacefully, and has been most comfortable all those hours. She could not distinguish anything but light from dark, but this morning there was a marked change, and she could tell baby's eyes were open.”

On May 29th I found the R. V. 10/200 and L. V. 20/50. In the right eye there were large plaques of exudation near the macula, and in the left eye a few patches between the macula and disc; also some small glistening white spots around the macula.

One year later, May 25, 1896, vision was 20/30 in each eye—no improvement with glasses. There was concentric contraction of the fields, the right disc was more pale than the left—otherwise the fundus appeared normal.

May 10, 1898 (three years after delivery), her physician informs me that she has considerable albumen in the urine. The vision, he thinks, remains the same.

Mrs. ———, aged 27, a primipara, pregnant six and a half months, consulted me March 19, 1897.

Family history good. The patient had been a great sufferer from rheumatism; feet swell at times, and at present are more swollen than usual, although she has no pain in them. No œdema of the eyelids, and no headache. She gave a history of sudden failure of sight, that was first noticed while in church.

On examination I found the R. V. 20/200 and L. V. 6/200. A neuro-retinitis, with large yellow-white patches of exudation in each retina. Hemorrhages in the retina were numerous, of dark color and irregular shape. The urine was loaded with albumen.

March 23d I saw the patient at her home.

With the R. E. she counted fingers imperfectly at 6 feet, and with the L. E. at 2 feet. The retinitis and hemorrhages had increased. The apparent rapid increase of exudation and degeneration in the coats of the blood vessels decided my course in the case, and I advised the induction of labor at once.

March 25th: The family physician, Dr. J. T. Howell, reported the R. V. perception of large objects, and the L. V. perception of light only. Premature delivery of a dead fœtus was accomplished early in the day—uræmic convulsions commenced soon after delivery and continued about two hours, and for 24 hours her condition was critical. Her recovery was slow.

One month after delivery (April 24th,) I found the R. V. 10/200 and L. V. perception of large objects. In the right fundus there were some small glistening white spots and some pigment, and in the left fundus a large amount of exudation and hemorrhages in and around the macula. The patient was very weak and despondent, and said she would much rather die than live with sight like this.

May 8th: R. V. 10/100; L. V. 1/200.

May 22d: R. V. 20/70; L. V. 1/200.

June 23d: R. V. 20/30; L. V. 8/200.

Aug. 2d: R. V. 20/20; L. V. 8/200.

May 28, 1898 (one year after delivery), I found the R. V. 20/20 and L. V. 12/200. The right disc was very pale, and the left disc almost white; there were a few scattered deposits of pigment in the right fundus, and a large amount in the left macular region.

Up to this time she had not been free from the albuminuria, and on two occasions during the past year, her physician tells me, she had a considerable quantity of albumen in the urine.

We have all seen pregnant women with defective sight due to an affection of the kidneys during pregnancy, carry the child to full term, and eventually recover perfect vision; in other cases, complicated by chronic Bright's disease, sight is permanently impaired, or lost by one or repeated pregnancies.

In my first case the optic neuritis and retinitis, especially the optic neuritis, was the prominent feature, while in the second case the retinitis and hemorrhages, especially the latter, was most noticeable. In the first case I considered the few superficial fan-shaped hemorrhages had but little significance; it is my opinion that if the optic neuritis had continued or increased for nearly two months longer

the woman would eventually have been almost totally blind from the resulting athropy.

In the second case a hemorrhage in the region of the macula undoubtedly caused the sudden failure of sight—the vision in one eye was probably very poor, but had not been noticed until a hemorrhage occurred in the other eye.

If abortion is ever justifiable, it is in these cases of chronic Bright's disease where there is a neuro-retinitis with hemorrhages, and almost total loss of sight probable, especially as the uræmic condition of the blood is dangerous to the life of the fœtus and a constant menace to the life of the mother.

In a recent report (1897,) of 10,233 cases published by the Society of the Lying-in Hospital of the city of New York, there were 42 fatal cases following delivery, and 12 of these were albuminuric. Six of the 12 had eclampsia. It also gives a total of 10 induced labors; of these 3 were albuminuric, with no death of mother or child.

There was no case of premature delivery to preserve sight, and no record of impaired vision.

My attempts to obtain statistics from the large lying-in hospitals of the frequency of impaired vision, and premature delivery to preserve sight, have not been satisfactory.

It appears to me desirable that this subject should receive more attention.

Retinal changes occur in from 20 to 30 per cent. of all cases of Bright's disease; (1) about $\frac{2}{3}$ of these cases of neuro-retinitis complain of some disturbance of vision, while the other $\frac{1}{3}$ gives no such indication of this serious condition, (2) and every practitioner must admit that serious eye complications occasionally exist when no albumen can be discovered in the urine. I reiterate what Dr. Noyes has written: * * * "Inspection with the ophthalmoscope is strongly recommended for the same prudential reasons which call for examination of the urine, even though there are no urgent symptoms" (1).

Of 22 cases reported by Silex (3) 11 recovered vision more than $\frac{1}{6}$. Ten others remained with a lesser degree of acuity, and 5 of them were almost blind; 1 had double detachment of the retina.

Finally, in considering the sacrifice of the foetus to preserve sight, we must take into account the expectancy of life, if the child should be born alive and the mother became blind. One-tenth of all the children born, die before the first month has been completed (4), and less than $\frac{2}{3}$ live to be 5 years of age (5).

For the mothers with defective or total loss of sight for the remainder of their lives we find, for example, in my cases, the first would have, if healthy, an expectancy of $39\frac{1}{2}$ years and the second $36\frac{1}{2}$ years.

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- (1) Noyes—Diseases of the Eye.
 - (2) Loring—Trans. Am. Oph. Soc., 1882.
 - (3) Annales d'Oculistique, February, 1895.
 - (4) Smith—Diseases of Children.
 - (5) Mortality Report; New York State (8 years).

A CASE OF INTERSTITIAL KERATITIS CONGENITAL IN ORIGIN.*

BY HOWARD F. HANSELL, M. D.,

PHILADELPHIA.

The opportunity was afforded me, through the courtesy of Dr. E. P. Davis of Philadelphia, to see the following case, the interest of which lies in the rarity of the affection (or the published account of it), and the possible confusion of its early stages with the purulent ophthalmia of infants:

A. H., 36 hours old, is the third child of apparently healthy parents. There is a family history in the grandparents of phthisis and diabetes. From birth the lids were swollen, blue-red in color, but not markedly distended or tense; a thin, watery, yellow discharge, moderate in quantity and containing neither mucus nor pus, exuded through the palpebral fissure; the palpebral conjunctiva was smooth and without enlargement of its follicles, or deposit in its stroma; the ocular portion of the membrane was greatly distended from the fornix to the limbus of the cornea by an almost transparent effusion, only slightly vascular and of the color of sclera. The fornix was also chemotic, and thrust forward into the fissure. Forceful separation of the lids and inspection of the cornea showed a gray infiltration of the deep layers, consisting of very fine points that tended to become confluent, most dense in the pupillary region and without vascularity or loss of epithelium. The pupils could scarcely be seen, particularly that of the right eye, in which the corneal opacity was more dense. The iris was not inflamed. The chemosis of the conjunctiva could readily be mistaken, at the first glance, for the white sclera, but close examination proved that the sclera was entirely hidden by the pallid and chemotic conjunctiva.

On the third day of the child's life, the under surface of the upper lid was partially covered by a tough, yellow, smooth membrane, closely clinging to and apparently forming a part of the conjunctiva. Detachment without pain or bleeding was impossible, and as it seemed to be a part of the process of inflammation, and was inflicting no damage upon the cornea, it was allowed to remain. Having ordered atropin, boric acid and formal 1-2000, I feared that the latter, because of the evidences of pain immediately following its use, was

*Read before the American Ophthalmological Society, New London, 1898.

responsible for the development of the false membrane. Its discontinuance, however, had no effect upon the absorption or increase in size of the membrane. It persisted, gradually growing smaller, until the subsidence of the swelling of the lids, when both it and the discharge disappeared.

The corneæ slowly became clear until in six weeks the slightest trace only of the opacity remained in the right eye. A few small vessels, extending from the limbus through the cornea, formed toward the termination of the disease.

The local treatment was exceedingly simple, and consisted of antiseptics and mydriatics. No silver was applied at any time. The main reliance was upon the general remedies instituted by Dr. Davis.

The cause of this unusual congenital inflammation of the corneæ will probably be found in the conditions existing before birth, primarily in the mother, secondarily in the child; upon these points Dr. Davis' report throws considerable light. "The mother is a tall, pale woman, having a pelvis slightly larger than the average, and symmetrical. During her second pregnancy she was comfortably well and her urine nearly normal. Her second labor was rapid and a male child, weighing 8 pounds, was quickly born. It was well-formed and healthy, and is now living. The patient made an excellent recovery from labor, but soon ceased to nurse the child. The patient's third pregnancy occurred soon after the second, when she was busy with the care of her children and was not strong. During this pregnancy excretion was poorly performed, and she was never well nourished. The third child, whose case is briefly described above, was born ten days before term. Like the second delivery, it was precipitate. The membranes were peculiarly soft, and were attached to the cord and to the cervix. They were friable and difficult to remove. The mother had a very profuse mucus discharge, but had not reported such discharge during pregnancy. Although the child's eyes were promptly cleansed with boric acid solution, and all antiseptic precautions taken by doctor and nurse, the child developed at once the condition seen by Dr. Hansell. The mother had no fever, and although the uterus required washing with the douche-curette, she had no other inconvenience."

The mucous membrane of the child's mouth and the mucous layer of the skin developed an eruption resembling purpura. Its bowels were frequently moved. It nursed eagerly and seemed fairly vigorous, although not as strong as the other children. The mother's milk showed on analysis: Fat, 1.31; sugar, 6.45; albuminoids, 1.50; mineral matter, .21; water, 9.55. It was deficient in fat to a considerable degree, very slightly in sugar. The child was ordered whisky in small doses, oil inunctions, and irrigation of the bowels with warm water daily. The mother's blood showed hemoglobin, 58 per cent.; red corpuscles, 4,320,000; white corpuscles, 8000. The blood cells were very pale, but uniform and fairly large. The child's blood showed hemoglobin, 82 per cent.; red corpuscles, 7,280,000.

white corpuscles, 10,000. The blood cells were very poor in appearance and small. It should be noted that this is decidedly anemic blood for an infant. The child has recently had several attacks of diarrhea and intestinal disturbance. The mother has suffered from profuse and frequent menstruation and a mucus discharge.

So far as the general conditions here are concerned, the mother's poor health during pregnancy would account for the ill nourished child. The mother has never had specific disease, nor septic infection.

In searching through recent literature I have succeeded in finding the report of only one case similar to mine, that of Barbacheff (*La Clin. Ophthal.*, Oct., 1896). He describes a slow inflammatory process in the deeper layers of the cornea, which he concluded was the continuation of a disease that had originated in utero. It closely resembled the above case in all essentials, and in some minor points, although the author designated it "congenital opacities." He alludes to the groundless fear that the inflammation had been induced by applications that had been made to the eye, but dismisses this fear after closer study of the character of the affection. The corneæ in his case became entirely clear.

DELAYED UNION AFTER CATARACT EXTRACTION.*

BY GEO. C. HARLAN, M. D.,

PHILADELPHIA.

So far as I have been able to learn, there are no statistics to indicate how long the wound may remain open after extraction without necessitating a grave or hopeless prognosis of the final result. The textbooks generally do not refer to the subject and tabular reports of operations give no definite data. As some of my friends, as well as myself, have looked in vain for comfort when the anterior chamber has remained empty after the first few days, I have thought it might be worth while to bring the subject before the society.

A few months ago I operated on a lady, eighty-three years of age. She was in fair health, neither diabetic nor albuminuric, but too feeble to take a journey and the operation was performed at her distant home, but she was left in charge of a good general surgeon and an experienced trained nurse. The operation was entirely smooth, there was no prolapse of the iris, and the pupil remained round and central. The usual compress and bandage were used, and after the second day the eye was carefully douched daily with warm boric solution by merely drawing down the lower lid without raising the upper, and atropia was instilled. On visiting her ten days later I was surprised to find not the slightest indication of closure of the wound. There had been no pain and the eye was quiet. The pupil was round and central—4 mm. in diameter—but lay directly against the cornea. The wound was in perfect apposition and there was no infiltration of its edges, in fact, it was almost impossible to locate it. Her general condition was not good; her tongue was dry, her

*Read before the July, 1898, meeting of American Ophthalmological Society.

appetite was failing and her spirits somewhat depressed. She had been sitting up in bed but was indisposed to get up. She was urged to dress and to resume as far as possible her usual habits and ordinary diet, and quinine and strychnia and a little brandy were ordered. At my next visit, seven days afterward, the anterior chamber was normal and the wound was firmly closed. Just when this occurred it is not possible to say, as, fearing infection or disturbance of the wound, I had left particular directions that the lid should not be raised. The edges of the wound were hazy, though the rest of the cornea was clear, and the base of the iris was adherent to the corneal cicatrix throughout, slightly dislocating the pupil upward. $V = \frac{1}{5}$ with probability of great improvement by capsulotomy and cylindrical correction.

This case called to my recollection one that I met with a good many years ago. As the patient had only one eye, the general condition was not good, and the lens was white, a preliminary iridectomy was performed. There was a slight escape of fluid vitreous when the incision for extraction was made, and the lens was removed in its capsule with a wire loup, without further loss. There was no vitreous in the wound, and it remained in perfect apposition but refused to unite for three weeks. A compress with bandage was used and atropia was applied. Finally, with the approval of Dr. Norris, who saw the patient in consultation, I applied the point of a mitigated nitrate stick, very lightly, along the whole course of the wound, and it closed a few days afterward. $V = \frac{2}{3}$ and remained good, though the patient's general health failed, until she died a few years afterward in an insane asylum.

Carl Barck, of St. Louis, has recently* reported two cases in which the anterior chamber remained open for more than two weeks in one and for two weeks in the other, with an excellent final result in both; and another which ended in corneal suppuration at the end of eighteen days. Berry alludes to the failure of the wound to close after two days as an unusual, though occasional, occurrence. Wecker says "it is a clinical fact that the union of the lips of the wound may, without inconvenience,

*American Journal of Ophthalmology, September, 1897.

be retarded for five or six days, either by repeated reopening or by a faulty co-aptation. without the existence of the eye being menaced, provided that infection be carefully guarded against during this period so propitious for inoculation." Becker, in Graefe-Saemisch, says he has seen the anterior chamber remain open for five or six days, even after perfectly normal extractions, and that the eye, as a rule, does not present any symptoms of irritative reaction and the termination is a favorable one. He therefore regards a late restoration of the anterior chamber almost as a favorable condition for the final result. He adds that these favorable cases must not be confounded with those in which union is delayed by increased intraocular pressure, when one may be thankful if the wound finally heals with a cystoid cicatrix. Jacobson* reports a case in which a good result was obtained after the wound had been open for more than four weeks. "The patient had some blepharospasm and the aqueous escaped regularly, as often as I left the bandage off, during the first three weeks. After I had convinced myself of the constancy of the condition, I kept the eye closed by a compressive bandage for ten days and nights in succession, after which the wound was closed."

Becker thinks that the cause may lie in the character of the wound, as, if ragged, it offers an imperfect apposition, but is more frequently to be found in lens substance or capsule lying in the wound and holding it open.

In a recent discussion of this subject at the two meetings of the Society d'Ophtalmologie de Paris, November 3, 1896, and March 9, 1897, Vignes reported two cases in which the wound remained open in one for ten days and in the other for twenty and finally healed without corneal opacity and with good vision. The first patient was diabetic and catarrhal. In the second there was no albumin or sugar but a decided diminution in the amount of urea, which he suggests might have some connection with the delay in union. In this case, in which union was delayed for twenty days, the pupil was slightly drawn up by

*Graefe's Archives, Vol. XI, 194.

adhesion of the base of the iris with the lips of the wound, but this did not occur until two or three days before the closure. This is just what occurred in the case that I have reported, and it seems likely that this adhesion of the iris promoted the union by checking the flow of aqueous humor.

Valude claimed rapid effects from iridectomy and said he had seen the anterior chamber close twenty-four hours after it was performed in cases that had shown no tendency to unite for several weeks. Terson also referred to a case in which the anterior chamber remained open for a month and a half and closed completely two days after an iridectomy was performed. He thinks that delayed union is much more frequent in the simple than in the combined operation.

Vacher in a case which remained for twelve days without reaction and without tendency to union, touched the lips of the wound with a solution of iodine, and the next day it commenced to cicatrize.

Bourgeois and Jocqs reported cases in which delayed union, in one case for two weeks and in the other for three, was attributed to entropion. In the former the anterior chamber was established the day after the entropion was relieved by operation, and in the latter the wound cicatrized completely forty-eight hours after the eye was left unbandaged.

Koenig referred to a case in which union was delayed for twenty days. He thinks the fact that union usually occurs promptly in diabetics and often in patients with diminished urea while it may be delayed in patients whose condition is quite normal, and that the vitality of the cornea is shown by its continued transparency, make it difficult to accuse the general condition; and most of those who took part in the discussion attributed delayed union to local rather than to general causes, or, at least, considered the latter as only predisposing.

Since this discussion, Valois* has reported the case of an alcoholic subject, seventy-four years of age, on whom an unsuccessful operation had been performed on the

*Recul d'Ophthalmologie, January, 1898.

other eye. There was no sign of union at the end of nine days, when the wound was lightly touched with the actual cautery and three days later it had firmly cicatrized. There was some corneal opacity but $V = \frac{2}{3}\%$. He also refers to another case in which the wound closed at the end of four weeks under the use of simple compress and bandage. The number of cases of delayed union reported by French surgeons since attention was called to the subject makes it seem probable that it is much more frequent than has generally been supposed. The fact that Becker, with his extensive experience and well known accuracy of observation, had never seen the anterior chamber remain open for more than five or six days after normal extraction, suggests the query whether modern methods of operation and the use of cocain may have any connection with this complication. With a view to getting some idea as to the frequency of delayed union, and if possible, as to the condition that causes it, Dr. C. J. Kistler, resident surgeon of Wills Hospital, has examined the records of five hundred consecutive extractions performed at the hospital. Cases which ended in sloughing of the cornea, panophthalmitis, or destruction of the eye by chronic cyclitis were excluded, and only uncomplicated cases in which useful vision was attained are noted. In four hundred and seventy-four of the five hundred cases the anterior chamber was reformed in less than five days, in nearly all of these within forty-eight hours. In twenty-six cases the union was delayed longer than this time and a tabulated report is given of such cases. In nine the wound remained open for five days, in two for six days, in two for seven days, in two for ten, in three for eleven, in two for twelve, in one for thirteen, in one for fifteen, in one for sixteen, in one for seventeen, in one for nineteen and one for twenty days. Fifteen were simple operations and eleven combined. In twenty it is noted that no complication occurred during the operation. Of the remaining six, prolapse of the iris occurred in four cases and was excised in two and replaced in two. There was slight loss of vitreous in one case and a bead of vitreous appeared in the wound in another, all very common accidents in cases that follow a perfectly normal course. There were

also a few complications, besides the delayed union, during the course of treatment. In one case considerable cortical debris was left in the anterior chamber, in one a small shred of vitreous was removed from the wound on the third day and it closed two days later, in two cases there was delirium, in one a prolapse occurred the day after the operation but subsequently smoothed down completely without interference, and the anterior chamber was reformed on the sixteenth day, $V = \frac{1}{2}$. In one prolapse occurred the second day after the operation, on the sixth, as the chamber still remained open, preparation was made to perform iridectomy, but under etherization the iris was spontaneously replaced and the wound was closed the next day. The ages of the patients varied from forty-five to seventy-five, a large proportion being over sixty. One is recorded as neurotic and two as feeble, but generally their condition is stated as good or fair. There were no diabetics or albuminurics among them. The degree of vision attained was from $\frac{1}{5}$ to 1; a case in which the wound did not close for fifteen days being included in the latter. In no case was the eye lost.

The various causes of delayed union that have been suggested are:

An irregular or a ragged incision;

The presence of bits of capsule, lens debris or vitreous shreds in the wound;

Hernia of the iris;

Adhesion of the iris to the posterior lips of the wound;

Pinching of the conjunctiva or iris in the angles of the wound;

Entropion occasioned or increased by the dressing;

Disturbance of the wound by too frequent examinations and dressings;

Failure of reparative power due to something in the condition of patients;

Excessive secretion of aqueous humor.

There is no special note as to the character of the wounds in these twenty-six cases, but as they were made by the same surgeons who operated on the rest of the five hundred, it may be presumed that they were made with about the same average skill. In my own case the incision was

better than my average, and on the tenth day its margins were in such close apposition that it could scarcely be distinguished. In two cases there was possibility of vitreous in the wound; in two the dressings were disturbed by the patients in delirium; and in two the delay in cicatrization seemed to be caused directly by hernia of the iris. As to simple adhesion of the iris to the posterior lips of the wound, it occurred in the case reported only just before the anterior chamber was reformed and seemed to me rather to promote cicatrization by checking the outflow of aqueous humor. Also in the case reported by Vignes, in which the wound remained open for twenty days, a similar adhesion occurred two or three days before it closed. There was no entropion in any of the cases, and nothing unusual in the dressing. This leaves twenty cases in which there was no known local cause. The probability that something in the condition of the patients was an important factor seems increased by the fact that in two cases the delay occurred in both eyes, while in a third the wound of a preliminary iridectomy, performed a month before the extraction, remained open for five days. In one of the cases reported by Dr. Barek there was retarded union—eighteen days—in each eye. In the case just reported cicatrization was evidently coincident with the improvement in the patient's condition, which had been much depressed, and I believe that a mistake was made in keeping her too long on an unusual diet and in not insisting upon her getting out of bed.

As for treatment: So many cases have been reported in which excellent results have been attained although the wound has remained open without interference for weeks, that a conservative course seems to be generally indicated. The outflow of aqueous humor is a protection against infection, but it is not known how long this flow may continue without endangering the nutrition of the ball. A permanent fistula is likely to result in atrophy. With the present light upon the subject, if the wound is clean and in good apposition, I would be inclined to give the compress and atropia at least a month's trial. If there is capsule or lens debris in the wound it may be well to remove it with the spatula. A prolapse of the iris should

be excised, unless it can be readily replaced. Iridectomy, even when there is no prolapse, is reported to have been promptly successful in a number of cases, and, whether it acts by merely freshening the wound or by modifying the secretion of aqueous humor, seems to have a basis in practical experience. Cicatrization followed stimulation of the wound by nitrate of silver, solution of iodine and the galvanic cautery in three cases. In case of entropion it becomes a question between relieving the condition by operation and removing the bandage. Berry says, in his textbook, that when the wound remains open longer than forty-eight hours, a light dressing that makes no compression on the ball should be substituted for the compress and bandage.

A CASE OF SYMPATHETIC INFLAMMATION FROM
ADHESION OF EYELID TO STUMP.
RECOVERY.*

BY DR. T. Y. SUTPHEN,

OF NEWARK, N. J.

On July 4th, 1893, I was called by Dr. Underwood, of Newark, to see Thomas G., a boy 9 years of age, who had been injured in the left eye, two hours before, by the explosion of a blank cartridge. A large piece of the shell had gone completely through the upper eyelid and had made an extensive and ragged wound in the globe, involving the iris, lens and ciliary body. The piece of metal had already been removed by the doctor, and the wound in the lid, after cleansing, was closed by sutures. The boy had had some malarial trouble just previous to the accident, and the enucleation, which seemed imperative, was deferred for a little to allow the patient to improve in a general way. There was no unusual inflammation following the injury, the boy being kept in bed and cold compresses made locally.

On July 21st the injured eye, being more or less irritable and hopelessly blind, was removed under ether. The right eye, at that time, was entirely free from any irritation, vision was normal and ophthalmoscopic examination negative. Recovery from the operation was quick and satisfactory, and the care of the case was left to the family physician.

Nothing wrong appeared until the morning of August 4th, fourteen days after the enucleation, when I was again called to see the boy because the right eye had been found red and irritable. There was considerable pericorneal injection, with photophobia and lacrymation, but apparently no iritis. A solution of the sulphate of atropia was order-

*Read before the July, 1898, meeting of the American Ophthalmological Society.

ed locally, and small doses of calomel given internally.

On August 6th, the inflammatory symptoms had entirely disappeared, and the pupil was widely dilated, but there was some distension of the retinal veins. Still this latter appearance was hardly sufficient to convince me that a neuritis was developing. The amount of vision was not determined, the boy appearing to see as usual. There was a watery and reddened condition of the lids of the left side, where the eye had been removed.

August 11th, the right eye appeared well; no ophthalmoscopic examination was made.

On August 12th was called again, as the inflammation had returned in the right eye with vigor. Quinine was ordered.

On August 14th the eye was again quite free from inflammation, but two or three slight synechiæ were seen at the upper pupillary margin, and the ophthalmoscope disclosed a well marked neuritis. Vision had dropped to the ability to count figures at six feet only. It was then determined to amputate the stump, and this was undertaken the following day. Upon endeavoring to raise the upper lid I was surprised to find strong bands of adhesion between the conjunctival surface of the scar in the eyelid and the nerve stump, preventing any freedom of motion of the lid, and causing traction upon the nerve with every act of winking. This revealed to my mind the source of the sympathetic inflammation. These bands were severed close to the nerve, and the operative procedure ended there. The boy was treated as before, the mydriatic continued and the mercurials pushed.

Within a day or two improvement was marked, vision rapidly gained, and a steady subsidence of the inflammation was followed by perfect vision, which has remained until the present time.

This case appears to me to be not only rare and of unusual interest, but it goes far toward establishing the fact that sympathetic inflammation may be caused in an otherwise healthy eye through irritation alone of the nerve stumps of its fellow.

THE LOCATION OF THE EARLIEST CHANGES OF
THE TRANSPARENCY OF THE LENS
IN SENILE CATARACT.*

BY DR. W. F. MITTENDORF,

NEW YORK.

The earlier symptoms of senile cataract, as long as it is in its most incipient state, are hardly appreciated by the patient, and it is, therefore, when other causes bring him to us, that we get a chance to observe and study them. It is a well-known fact that lenticular opacities can exist for many years before the vision of the patient, for distant objects especially, becomes affected. The changes of the refractive power of the lens, which is one of the very first symptom attracting the patient's attention to his eyes, is perhaps not so often the cause of complaint as some of our text-books would make us believe. These symptoms are twofold; they may be due to a swelling of the lens antero-posteriorly, with more or less contraction of the vertical and horizontal meridians, and which may be or may not be accompanied by much opacity of the lens. It is usually observed in rather old persons, and calls for a change for weaker reading glasses, or an abandonment of all glasses for near work. On the *other* hand there is sometimes a general shrinking of the lens, with slight loss of transparency, especially of the nucleus, and in such cases a rapid increase of the strength of the reading glasses is the result.

However, these symptoms are very often absent in the earliest stages of cataract; and it is the progressive stage, with its usual demand for increase of power of reading glasses, which brings such patients to us. In these cases the peripheral striæ of opaque lens tissue are usually the first evidence of a beginning cataract. The opacities are

*Read before the July, 1898, meeting of the American Ophthalmological Society.

usually very fine and small, and it may be difficult to differentiate them from the usual appearance of the margin of the lens as we see it in the typical cases of Gerontoxon lentis. It has been assumed that these striated opacities start usually from all parts of the periphery of the lens alike; but this is not the case; they are usually found at the inner and lower quadrant of the periphery of the lens.

Observations of this kind were made by one of our colleagues several years ago, but some European writers protested against this, maintaining that central opacities were more frequent than peripheral ones. As my experience was entirely in harmony with that of the first writer, I commenced to make careful notes of all the incipient cases of senile cataract which came early enough under my observation to enable me to see the exact location of the first changes in the transparency of the crystalline lens.

The result of these 508 cases so far observed have been as follows:

1. Central; these include the nuclear as well as the central cortical changes, and are 106 cases in all. Of this number 61 were of the nature of a diffuse cloudiness at or near the center of the lens, and in the great majority of cases occurred in myopic eyes, which amounted to 46 out of 61 cases, or just about 75 per cent. Forty-one showed the appearance of striæ, or fissures in the central substance, with a more or less clear periphery, and in 5 cases a *punctate* appearance was observed in the lens.

2. Peripheral changes, with a nearly perfectly clear center and no diminution of the visual power, except that caused by coexisting hypermetropia or astigmatism, amounted to 402 cases. Of these the small number of 18 were recorded as simple Gerontoxon lentis, and perhaps these ought to be excluded, because they do not always develop into cataracts, although I have begun to look upon them with suspicion as they are only too frequently the forerunners of real lenticular opacities.

Of the remaining number the starting point of the opaque striæ was found to be in the upper peripheral part of the lens in 13 cases only, in the outer periphery in 47

cases. Of a general peripheral kind we had the number of 48, and of the lower and inner quadrant the great number of 286 cases.

In examining older patients for the purpose of prescribing glasses, it is not always advisable to use a mydriator, and unless we are careful to have the patient look well downward, opacities of this kind often escape detection, and as it is of great importance in regard to the future hygiene of the eye we should be careful not to overlook them, and this has been one of the main purposes of my paper to caution you not to neglect to examine the inner and lower quadrants of the lens *especially* carefully. It is difficult to overlook central opacities, even if they are very small, but in an eye with an undilated pupil it is different, and there is great danger to overlook very peripheral opacities even if they are quite extensive, yet remaining and expanding more around the periphery than toward the center of the lens.

It is not the place here to speak of the prognosis of these cases; yet, according to my experience, central opacities lead more frequently, or rather more rapidly, to a general clouding of the lens, especially the uniformly diffuse ones, whereas I have seen fairly well advanced cases of peripheral striæ remain in *statu quo* for many years. In one case which I have observed regularly once or twice every year, and most recently only a few months ago, the changes have become stationary and remained nearly the same for nearly 20 years.

If cataractous changes depended upon senility only, the great frequency of the formation of an opacity at this one point would be difficult to explain, but as changes of nutrition of the lens play, perhaps, the most important role in all cases, it may be pardonable to assume that constant occupation with small objects, especially reading by artificial light, requiring a more or less forced convergens and a downward look, act by pressure of the surrounding tissues and especially of the muscles, as an impediment to the nutrition of the lower and inner portion of the periphery of the lens.

The fact that most of the myopic eyes were represented in the class of central opacities might be due to the fact

that many of these myopes may have used only one eye for near fixation, and then partly on account of slight choroidal changes the nutrition has suffered more generally than locally.

Finally, I have to mention that all traumatic and congenital cataracts, as well as senile cataracts, have been excluded, as the object has been to study the very initial stages of senile cataracts only.

In order to recapitulate:

Total number, 508 cases: $\left\{ \begin{array}{l} \text{Peripheral, 402} \\ \text{Central, 106} \end{array} \right\} 508$

At different parts of the periphery of the lens, 116 }
At lower inner quadrant, - - - 286 } 402

Diffuse central opacities, senile only, 61; of these myopics 46.

RODENT ULCER OF THE LIDS OCCURRING IN A
PATIENT TWENTY-THREE YEARS OF AGE.

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AND

WM. KRAUSS, PH. G., M. D.,

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PATHOLOGIST TO ST. JOSEPH'S HOSPITAL; INSTRUCTOR IN PATHOL-
OGY, MEMPHIS HOSPITAL MEDICAL COLLEGE.

ILLUSTRATED.

Malignant epithelial growths are not common in young persons, and the type of growth presented by the patient whose history is here recorded, is quite rare at any age. The case is presented on account of the above interesting pathological features, and also because clinically every plastic operation on the lids presents phases not met with in other cases.

On June 17th, 1898, I saw, at the request of Dr. P. M. Farrington of the City Hospital, a colored boy, aged twenty-three, with a tumor at the outer canthus of the left eye. He had first noticed it two years before as a lump, which became superficially ulcerated and covered by a scab. The growth was very slow, and in the spring of 1897 an operation was undertaken by a surgeon of this city, who, from the patient's description, removed the growth with a curette. The wound healed and for several months showed no evidence of a return. In the fall of 1897 it reappeared, and in February, 1898, was removed by Dr. E. M. Holder, of this city, by a plastic operation, turning up a flap to cover the site of the growth. The wounds healed, but in about two and a half months, when he was admitted to the hospital for a compound fracture of the skull, the growth had

again appeared. I deferred operation on account of the injury referred to, till the rapid spread of the disease made action imperative. In the week preceding operation the growth almost doubled its size and I was obliged to adopt another plan of operation than the one which had at first suggested itself.

The condition at time of operation was as shown in the photograph and drawing. There were three ulcerated nodules, one on the



Fig. 1. Rodent Ulcer of the lids in a patient 23 years old. Being a tin-type the sides of the figure are reversed. The dressing on the forehead is over a compound fracture of the frontal bone.

upper lid at its outer end, one on the lower lid at its outer end, and one lying just without the canthus and above the level of the palpebral fissure. In size they were 15 mm., 18 mm. and 24 mm. in length respectively, and about half as wide. The lower lid was involved through its whole thickness, but elsewhere the growth included skin and superficial fascia only, and rested on an indurated

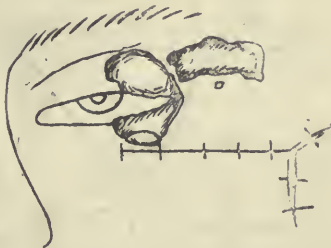


Fig. 2. To show the size and location of the tumor masses and the scar of a former operation.

base of great hardness. The infiltration was very sharply limited and the masses freely movable. There was no glandular involvement. The patient's color prevented noting the vascular condition of the adjacent skin. Down and out from the tumor could be seen the scars of the last operation. The condition is fairly well shown in the accompanying photograph and in the drawing (Fig. 2).

The operation was done under general anesthesia, with the

assistance of Dr. Goltman and the hospital staff, and can be better understood from the accompanying diagrams (Figs. 2 and 3) than from any description. The outer half of the lower lid was entirely removed, but elsewhere the removal of the skin and superficial fascia was sufficient to get rid of all visible traces of the growth. By referring to Fig. 2 it will be understood that the cicatrix crossed both of my flaps, and though very undesirable, could not be avoided.

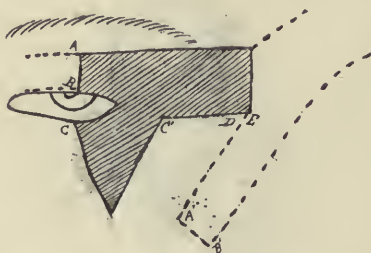


Fig. 3. To show the lines of incision and the raw surface to be covered.

The tongue flap E. A.' B.' was not long enough and a small skin flap was turned up from the inner half of the upper lid, and drawn out to meet A.' B.' The replacement of the lower lid was after the method of Diffenbach. The large raw surface was partially covered by deep sutures drawing in the corners of the space, as indicated. The operation was very tedious by reason of the old

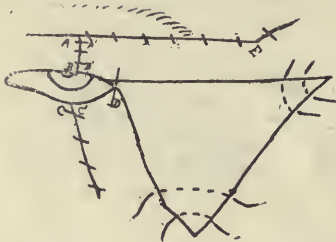


Fig. 4. To show the disposition of the flaps and the extent to which the raw surface was covered.

cicatrices, and occupied nearly two hours. The bleeding was very free and was controlled by hot compresses and pressure. The lines of the flaps were sutured as shown and the usual dressing applied.

My first plan was to restore the upper lid by Frick's method of turning down a flap from above, but at the time of the operation I found the growth too extensive. Wecker's method of turning down a tongue flap from the forehead for restoring both lids and the canthus was abandoned on

account of the extent of the growth outward, and the fact that the patient's hair grew low on his forehead. I had intended covering the raw surface with Thiersch grafts, but it was dark when I finished, and sufficient artificial light was not to be had in the institution at that time. I am of the opinion that a long tongued flap turned down from the frontal region above the brow, with its base outward, would have been better a operation than the one I did.

As might have been expected the ends of the two large flaps sloughed superficially, due to the fact that their nutrition was interfered with by the old scars. The stitches were removed on the fifth day, and the wounds subsequently dressed with aristol ointment.

The healing was prompt and very gratifying. The patient ob-



Fig. 5. Camera Lucida drawing. B. & L. Oc. 1 inch. A. Squamous epithelium with columnar and embryonic border. B. Corium, hemorrhagic and round celled infiltration.

Red discs drawn too large.

tained two useful lids and the contraction from the surface left to heal by granulation was not so great as I had expected. About the first of August a small nodule appeared in the line of the incision just below the center of the lower lid. I advised its removal, but the patient decided to try the efficiency of a cure by some caustic paste, a wise decision in view of the failure of three operations, and the fact that all available material for flaps had about been exhausted.

Sections from the edge of the ulcerating tissue were hardened in Zenker's fluid and stained with Picrocarmine.

The growth showed the characteristic picture of rodent ulcer. There was proliferation of epithelial cells, especially of the columnar border. Numerous islands of columnar cells appeared in the corium in many places. The

stroma was richly cellular and hemorrhagic, even to the point of ulceration. The differentiation from squamous epithelioma was well shown by the abundance of embryonic columnar cells, absence of cell nests and the very juicy, almost embryonic, stroma which constituted the smaller portions of the mass.

The coil gland invasion, which is believed by some to be the origin of rodent ulcers, does not seem apparent in this case. It appears as if there was a multiple invasion from the surface, although in portions (not shown in the drawings) there are some islands of columnar cells, which, however, might be transverse sections of advancing plugs from the embryonic border of the epithelial evergrowth. Invasion of the deeper tissues is doubtless prevented by the rapid softening of the stroma, thus breaking the continuity and leaving an ulcer.

In the illustration (Fig. 5), owing to smallness of the drawing, the red discs are indicated by rings which are larger than the round cells, which are a trifle too small, so as to differentiate them from the epithelial nuclei.

Continental Building.

TRAUMATIC RECURRENT KERATITIS, KERATALGIA AND CILIARY NEUROSIS.

BY DR. H. GRADLE,

CHICAGO.

Arlt seems to have been the first one to point out that superficial or scratched wounds of the cornea will, in some instances, cause recurrent erosions at subsequent periods. This topic however has not received much attention by text books. Many large works like Graefe-Saemisch and Noyes ignore it. Fuchs speaks of it more fully than any other book.* De Schweinitz barely refers to the possibility without going into details. Hansen Grut* drew attention to a form of bullous keratitis primarily due to trauma with relapses at subsequent periods. A case illustrating this form of disease was presented by Horstman at the German Naturforscher-Versammlung, in 1887†. A woman of 40 years had a vesicle on the cornea the size of a lentil, presumably from a scratch by a hair. It healed within a few days, but attacks of a bullous keratitis recurred eight times under the author's observation at intervals of weeks. The attacks were preceded by severe pain, especially along the course of the supra-orbital nerve. Local treatment was of no avail. On the view that a neuritis might be the underlying condition a constant current was employed for weeks, and during the next nine months of observation no more attacks recurred. In 1888 the subject was again brought up by Grandelement before the French Opth. Society.‡ Under the name Keratalgia he reported eight cases of recurrent attacks of pain in the eye with ciliary irritation lasting several days, all traceable to some previous superficial corneal lesion, but with absolute integrity

*International Congress at Copenhagen. Abstr. in Centralbl. f. Augenheilkde, 1884, p. 330.

†Abstr. in Centralbl. f. Augenheilkde, 1887, p. 298.

‡Centralbl. f. Augenheilkde, 1888, p. 166.

of the membrane at the time. Later* on he referred to four other observations in which nearly daily attacks occurred of a similiar character, but lasting only from one-quarter to one-half hour. In 1889 Bronner spoke before the Ophth. Society of the U. K.† about two instance of periodic recurrent attacks of pain and ciliary irritation after corneal lesions, but without appearances of active disease in the cornea. In one of them a cure was obtained by excision of a small corneal scar. The discussion, both at the French and English Societies, showed that many others had observed similar cases, but no further light was shed upon the subject.

My own observation has shown me a variety of consequences resulting from superficial corneal wounds. In no case have I seen any similar accident following deeper wounds.

I. In the first place I would call attention to the occasional persistence of grayish infiltration after such small wounds with correspondingly persistent symptoms of ciliary irritation. The grayish spot disappeared completely when cured, hence it was not a mere scar. Indeed, examination with a lens showed that the surface lustre was not perfect over the spot. There may not be any ciliary injection whatsoever, but a slight vascularity is always brought on by exposure to light or manipulation. In all my instances a slight narrowing of the lid-aperture was apparent on close comparison with the normal eye. I have seen this condition after the removal of cinders from the cornea or following superficial scratches from various accidents in some ten instances. It had lasted a period of weeks up to two years in different cases before they came under treatment. In no case was there any anomaly of the conjunctiva or of the tear passage to account for the persistence of the lesion.‡

The treatment consisted in rest of the eyes (shade) and the dusting in of calomel (successful in three instances,

*Annales d'Oculistiques, p. 187, 1889.

†Ophth. Review, July, 1889.

‡A similar persistence of slight irritation is sometimes witnessed after the healing of corneal ulcers, but as a rule this disappears spontaneously.

presumable success, but not controlled by myself three cases, failure four times).. When this proved insufficient I used atropin in the next place (one success, two failures). In three rebellious instances cauterization with the hot wire ended the trouble.

II. After a variable period of persistence of such mild ciliary irritation, the process may light up suddenly with acute symptoms. I have seen this in four instances, one of them being a second attack. In every one I have found a circumscribed superficial keratitis in the form of a small spot of gray infiltration with roughening of the epithelial surface. In no instance could I see any vesicular detachment of the epithelium, although two were not seen early enough to be conclusive. This outbreak lasts rather less than a week with tendency to spontaneous termination. Under calomel, atropin and rest they all recovered, and two of them I know to have staid free from relapses for several years.

III. In other instances similar attacks of circumscribed superficial keratitis occurred within months or even over a year after the healing of a corneal abrasion, but with alleged integrity of the eye during the interval. Five patients of this kind have come under my observation but as I saw none of them during the interval I cannot vouch for the absolute integrity of the cornea prior to the attack. I have no reason, however, to discredit their history of perfect freedom from irritation in view of the two observations to be quoted later on. Moreover in every instance the corneal lesion disappeared absolutely. The attack was always preceded by considerable pain. In three of them the attacks were recurrent two, three and six times. In none of them did I see any vesicle. In two the epithelial roughness was so pronounced when seen on the second and third day that I could not exclude a prior epithelial detachment. No cause could be assigned in any instance. The lesion consisted, in two instances, of very small linear gray streaks of infiltration. In the others the gray patch was larger and more irregular.

In three instances the influence of antipyrin upon the pain was very pronounced causing a marked subsidence of the irritation as well as of the radiating pain and appar-

ently not merely for the time but permanently. They all got well under the treatment referred to above in the course of a few days, and of three I know that no relapses have occurred.

One of these patients presented exceptional features—enough to make a report of the case profitable.

Mrs. R., a woman of 30 years, markedly neurasthenic, had scratched the eye with a fan about three months previously, but suffered only for a few days. The trouble began with neuralgia of the first branch of the fifth nerve, lasting about three days with short intermissions or rather remissions. The eye showed scarcely any vascularity and appeared normal except for a slight narrowing of the lid space. There was, however, decided photophobia and watering. Her physician had tried quinine in vain and had calmed her with morphine. I found a minute gray streak of keratitis. Antipyrin checked the neuralgia promptly and needed but a few repetitions of the dose (one gram). Under a shade and the use of calomel the keratitis disappeared entirely in three days and I have known her to remain free from trouble for at least six years.

While all the instances so far considered were of traumatic origin, it must not be overlooked that similar short transient attacks of superficial circumscribed keratitis with or without vesicle formation, but with preceding pronounced pain may also occur in the absence of any history of trauma. In the following case an injury to the right eye might have been forgotten, although it was definitely denied. Of special interest, however, is the occurrence of the same form of disease in the left eye, hitherto a perfect and uninjured organ.

Mrs. G., 35 years old, apparently in good health, has had periodic attacks of keratitis of the right eye since 6 years. She cannot recall any injury or other presumable cause. The attacks occurred at least once in several months but lately about six weeks apart—often but not always coinciding with menstruation. Each attack lasts a number of days, up to two weeks. Formerly every spell was preceded by severe headache, more recently this has been absent, there being only local pain. She claims that several oculists saw a “blister” at the beginning of an attack. No treatment had given her relief except atropin.

On January 29, 1898, after a week of suffering, I found a pear shaped, gray figure superficially in the pupillary area of the cornea, about 1 by 2 millimeters in size. It was characterized as an active keratitis by the dullness of the surface over it and by the ciliary injection. Its outline was well defined in the clear cornea, its area, however, not as gray as its edge. It was $\frac{20}{60}$ in RE. (atropinized)

$20/25$ in the normal L E (As). Under the daily inspersion of calomel the inflammation ceased within three days. Six week later V. of R E was $20/30$. The corneal infiltrate has cleared throughout its area, but its edges are still well defined on lateral illumination—evidently a permanent condition. There has not been the least irritation of the eye since that time—a period of six months.

The left eye, however, which had never given trouble, began to pain severely the night of April 23, the pain extending into the left side of the head. During the day the eye became inflamed. One gram of antipyrine, with which I had supplied her, stopped the headache completely and made the eye less uncomfortable. The next day I found a superficial central keratitis of the left eye, in the form of a circular, gray figure sharply circumscribed, with roughness of the epithelium over the figure, but neither vesicle nor abrasion. V. reduced to $20/60$. In three more days all inflammation disappeared (under the continued use of antipyrine and locally calomel). There has been no relapse since (four months).

IV. Entirely different from the class of cases so far described are those instance in which a superficial injury to the cornea leads at some subsequent time to transient but recurrent attacks of pain and ciliary irritation without visible corneal lesion. The long interval between the injury and the subsequent spells—five years in one, two years in another case might throw doubt upon the etiologic relationship. This, however, is strangely suggested, if not proven, by the occasional reappearance of a transient, visible lesion in that part of the cornea where the original injury had occurred, of which I have a complete record in the first case. Yet at any other time, even during attacks, no lesion could be detected in the cornea of either patient. I would, however, call attention to the increased turbidity of the cornea of the first patient during severe attacks. This was demonstratable only by lateral illumination, but was sufficiently pronounced to account for the transient dimness of sight. Its pathology I take to be a stasis in the lymph channels of the cornea. The following are the cases observed by me:

I. Mr. S. had his left eye removed in 1878 for a deformity—presumably a staphyloma resulting from conjunctivitis neonatorum. In 1880, then 27 years of age, I ordered for him eyl. 1.5 D axis 180 for slight asthenopia which gave him $V = 20/30$. In April, 1880, the cornea of the R. E. was scratched by his baby's finger nail. There was a small abrasion below the pupil with intense irritation which subsided in the course of one week. About 1885 he began to have

spells of pain during the night or early morning. A scratchy feeling in the right eye increased to a decided pain during some 15 minutes and then gradually disappeared. The eye watered during the spell, was bloodshot and the sight was often blurred for hours afterward. The attacks increased in severity and frequency, so that in summer, 1887, they occurred a few times every week, but were not always equally severe.

I found at the time moderate hyperemia of the superior retrotarsal fold with a trifling mucous secretion, slight injection of the superficial ocular vessels, augmented by any manipulation, normal cornea, pupil and fundus. V. with cyl. — 1.5 ax. 0 was $\frac{20}{30}$. Accommodation normal. General health perfect except moderate constipation. Repeatedly I saw him on the morning after severe attacks, when his sight was as low as $\frac{20}{50}$, but could not find any lesion beyond increased vascularity.

I was not in the habit of looking for variations of corneal turbidity at that time. I could not account for the spells satisfactorially. A corneal origin, my first supposition, was not supported by any findings on the cornea itself which appeared normal. The vague idea of a gouty diathesis (Hutchinson's irritable eye) induced me to try salicylate of sodium in large doses but without effect. As there were some nasal symptoms, especially transient engorgement of the cavernous tissue, the possibility of a nasal reflex was considered. But cauterization of the right inferior turbinal, while rendering the nose clearer, had no influence upon the attacks. A slight mucous secretion of the conjunctiva, together with the congestion of the retro-tarsal fold had led me to apply nitrate of silver solution, which, however, proved unusually irritating. The attacks—of variable severity—came, perhaps, a few nights in succession, then were absent for a few days, the longest intermission being two weeks during four months of observation.

During the following years Mr. S. consulted many other oculists without benefit. The continued use of atropin, a change of glasses, dietetic cures and traveling proved of no avail. I saw him again in May, 1894, practically unchanged. I learned then that while under the care of Dr. Samelsohn, of Cologne, two years ago, a vesicle had been observed on the cornea.

During the summer, 1894, the attacks became more frequent, sometimes up to three in one week and even several in one night. Their character was still the same; a scratching feeling increasing to real pain, lasting 5 to 15 minutes, accompanied by watering and leaving the eye red and irritable and tender to the touch for a number of hours—often with dimmed vision. There was always some mucous secretion after each attack. Occasionally a right-sided headache persisted for some hours. The time of occurrence was in the early morning, before awakening.

On Sept. 28, I found, in the morning after a severe attack, an irregular abrasion transversely across the cornea at the site of the scratched wound in 1880, of which I still had a record with a diagram.

Its floor was grayish and extending from this abrasion were two fine gray lines in the substance of the cornea (distended lymph channels?). With lateral illumination and a strong magnifying lens the entire cornea appeared uniformly turbid in a much higher than the normal degree. The ophthalmoscope did not reveal this turbidity though it showed, of course, the abrasion. The fundus was normal. The corneal turbidity was sufficient to account for the low sight, viz. $\frac{20}{70}$ (minus), which was very little influenced by his glass (C — 1.5). Of course there was moderate injection of blood-vessels, both the conjunctival and ciliary vessels. On the following day the abrasion had healed, there being only some slight corneal haze and a delicate cloud on the site of the abrasion. On the fourth day the cornea was absolutely normal, likewise his sight.

A corneal lesion was again seen in the same site on Jan. 16, 1896, after a severe attack. This time there was no abrasion, but merely a delicate gray figure resolved by a strong lens into fine dots, with decided increase of corneal turbidity as shown by lateral illumination and a corresponding dimming of sight. A month later again another severe spell was followed by a visible corneal change in the form of a minute erosion, which closed in one day. At no other time could any lesion be detected in the cornea, except the uniform increase of turbidity during severe attacks.

In order to study the frequency of the attacks and any therapeutic influence upon them Mr. S. tabulated them from Oct. 1, 1894, to December 31, 1896, classifying them under four degrees of severity— which he believed he could distinguish. The record shows 34 spells in the last quarter of 1894, 83 in 1895, 49 in 1896, a steady diminution. Likewise the proportion of severe to milder attacks has been reduced. On Jan. 28, 1895, he got a severe attack of migrating erysipelas beginning on the back and lasting nearly three weeks. During this time and for the next two weeks he remained free from ciliary pain—after that time the spells occurred as before. Salicylate of sodium in large doses, Fowler's solution of arsenic, antipyrin, calomel inspersion, atropin, locally, have had no influence. Cocain gave only short relief. His original glass cyl. — 1.5 ax. 180 had been changed by another oculist to sph. + 75 with cyl. — 1.5. This, however, gave him less perfect vision. The best possible correction I found to be cyl. — 1.25 ax. 165, both when normal and when under atropin, but the change did not affect the ciliary neurosis. His corrected sight was about $\frac{20}{25}$, but he required a plus glass for his presbyopia. In May, 1895, I suggested the local use of pilocarpin at bed time. The tension, however, was normal. He claimed at once an improvement and has kept up the miotic solution at intervals for three years. But on calculating his own record I find but a slight difference in the total number of attacks with and without pilocarpin. During 63 weeks of pilocarpin he had 73 spells, while during 33 weeks without it he had 48. The relation of mild to severe attacks is almost the same during both periods. But the relative frequency of severe attacks has been considerably

lessened for the entire period since he began the use of pilocarpin, whether in consequence or spontaneously being an open question. This, together with the gradually lengthening intervals, has impressed him with the utility of pilocarpin whether justified or not.

The patient presents thus a history of 13 years of attacks of ciliary irritation of irregular periodicity. During the intervals his eye is normal, except for slight vascularity and irritability. Each attack presents the symptoms which are usually produced by a superficial corneal lesion, viz., scratching and pain, sometimes one-sided headache, watering and vascularity of the conjunctiva, but with very slight ciliary injection. After the attack of pain has ceased the eye remains irritable and tender for hours, often with diminished vision. The dimmed vision—a few times as low as $\frac{2}{30}$ —I could not account for it at first. More recent observation has given me the explanation, viz., the uniform turbidity of the cornea, which, as I have shown elsewhere (*Ophthalmic Record*, Sept. 1898.), can only be seen on using a strong magnifying lens with lateral illumination. A number of times I have satisfied myself that there was a definite relation between the impaired sight and the degree of corneal turbidity.

But what lesion was the cause of all these irritative symptoms?

On these separate occasions I saw a corneal lesion—once a distinct grayish punctate infiltrate, twice an abrasion. Another oculist is said to have seen a vesicle at another time. As I saw the lesions within six hours after their formation I can state definitely that they were not vesicular under my observation. Since these lesions occurred in that part of the cornea where I had seen the fingernail scratch in 1880, a connection between these occurrences seem very probable.

Yet the most minute examination showed integrity of the cornea during intervals as well as after all of the attacks which I had chanced to witness (except that the severe spells caused often an exaggeration of the normal turbidity). But nevertheless I cannot account for the pathology of the case, except on hypothesis, that a corneal erosion left some local, though invisible change, which remained latent for five years, but which has since maintained a

slight ciliary irritability with periodic attacks of severe ciliary irritation and has a few times led to a transient-visible lesion in the cornea. The closest enquiry has shown no factor in the man's habits or environments which could account for the irregular periodicity. It is worthy that longest intervals between attacks—5 weeks—occurred in connection with a severe erysipelas.

II. Dr. R., 35 years old, a physician with ophthalmic training, remembers scratching his left eye with a comb two years ago. As he was but little annoyed, except for a couple of days, he soon forgot the accident. His health is perfect. The habitual correction of a low degree of hypermetropia and astigmatism gives him $V = 20/20$. Since this winter he finds that after awakening he cannot open the left eye except by force and that it stays painful and irritable for a number of hours. The attacks have come at irregular intervals, increasing somewhat in severity and frequency occasionally recurring daily for a few days. During the intervals the eye is normal. I saw him within three hours after awakening on several occasions, the severest attack being May 5, 1898. The upper lid was decidedly edematous, the conjunctiva palpebralis vascular but not inflamed, there was no mucous secretion, but pronounced peri-corneal ciliary injection, and decided tenderness to pressure. Tension, cornea, pupil and fundus absolutely normal. Vision slightly dim subjectively reached barely $20/20$ (corrected). In other words a group of symptoms without an explanation. The clue was furnished a week later by another severe attack, this time with impairment of vision to $20/50$. This time there was a delicate circumscribed "dotted" sub-epithelial infiltration below the pupillary area. Lateral illumination showed the cornea slightly hazy around this figure. In 48 hours the lesion had completely disappeared. I suggested the inspersions of calomel. Its utility seems confirmed by the cessation of attacks, until Dr. R. neglected himself in June. In July a few mild attacks occurred, but ceased again after resorting to calomel.

Dr. R. was under the impression that the attacks were most likely to occur after periods of overwork or anxiety.

Regarding his cases of keratalgia Grandelement suggested that they were due to neuritis of a nerve-twigg in the cornea. A neuritis is scarcely probable without visible opacity in this transparent tissue. Yet an irritative process of some kind involving a corneal nerve-fibre would explain the severe pain in some of the instances as well as the periodicity of the attacks, both those without corneal lesion and those with transient inflammatory action. This would also agree with the decided influence of

antipyrin upon the local and the irradiating pain in the attacks of recurrent keratitis. In the two last described as, however, antipyrin had no effect upon the spells of ciliary irritation without corneal lesion. Whether these peculiar accidents are due to a persistence of some infectious material in loco after gaining entrance at the time of the injury is an open question. It is noteworthy that all the patients except the last two reported and two of the first cases (continuous lesion without exacerbation) were females. In none of them did the history or the examination show any relation to hysteria, a supposition which was suggested at the discussion before the French Ophth. Society.

SPONTANEOUS EXPULSION OF A FOREIGN BODY FROM THE ANTERIOR CHAMBER.*

J. P. WORRELL, M. D.

TERRE HAUTE, IND.

Master L., aged 15, two weeks previous to his first visit to my office, received an injury of the right eye while exploding a gun cap by striking it with a hammer. His sight was impaired at once and the eye became red, there being, however, but little pain. His physician reported the appearance of pus in the anterior chamber at the end of a week, though probably this was a deposit of lymph. The treatment had been some simple wash. The boy was brought to my office on the 6th of January, 1883, when the following conditions were found:

Sclera deeply engorged, being almost livid in color; cornea hazy throughout, preventing any view of the iris. The lower half of the cornea was entirely opaque and bulging. The pain was slight with occasional exacerbations. Perception of light and projection good. Ordered atropia and compress bandage. Under this treatment the eye in a few days became entirely painless. Schleral engorgement lessened and clearing of the cornea proceeded to a degree permitting a comparatively satisfactory view of the upper part of the iris which appeared to be healthy. Pupil moderately dilated, central portion of which was occupied by a small deposit of lymph. The lower portion of cornea, involving its lower and nasal half still cloudy; the bulging previously mentioned, unchanged. Across it a few small vessels from the adjacent corneal margin. Upon its surface $1\frac{1}{2}$ mm. in length and very close to the limbus, was visible fine horizontal linear cicatrices. Behind this portion of the cornea was indistinctly seen an ovoid body, yellowish in color with apparently well defined outlines, its position not undergoing any change in alteration of position of the eye. That portion of ciliary region corresponding to the position of

*Read before the July, 1898, meeting of the Am. Ophth. Soc.

the yellowish mass continued to be deeply engorged. Other portions of the sclera becoming pale and nearly normal in appearance. Absolute freedom from pain; no tenderness on pressure.

On the 13th of the same month my notes state that under the continued use of atropia and compress bandage, the cornea had cleared up until there remained but a slight diffuse opacity in the lower and inner quadrant. In consequence of the bulging at this point the anterior chamber was very deep. There was now distinctly seen an oval yellowish colored mass 4 mm., in length, lying in the bottom of the chamber and rising about $2\frac{1}{2}$ mm., toward the pupillary border. The pupil was still dilated upward, circular in shape, except that at the lower and inner portion was a notch due to rupture of the circular fibres. Behind the notch extending nearly to the centre of capsule, a sharply defined line, appeared showing black when seen with the ophthalmoscope and gray by lateral illumination, due to a slight rupture of the capsule. In its neighborhood a faint lenticular opacity was recognized. The sight much improved and fundus readily illuminated.

On the 16th of February the conditions had much improved. Ciliary injection had disappeared save in the neighborhood of the yellowish mass. The cornea had cleared up, showing on its inner surface, or situated in the innermost layers near the limbus, a dark point apparently from the infiltration of pigment. Just above it, under examination by oblique light, there came distinctly into view a bright reflecting surface, the metallic nature of which could not be mistaken, nearly square in outline, its sides being $1\frac{1}{2}$ mm. in length. This could also be seen by ordinary daylight, the cornea being sufficiently transparent to permit a clear view of the body. It lay in a plane nearly vertical, its upper edge leaning backward about 15° from the vertical and being at an angle of about 40° to the surface of the cornea. Its lower margin was engaged in the innermost layers of the cornea, the transparent tissue of which permitted an easy examination.

Operation for removal of the foreign body had been suggested at various earlier times, but I now recommended its extraction with some importunity. This, however, was declined. Vexed that so obvious a course should be

refused I doubtless manifested my impatience and expressed a wish that the patient assume, thereafter, the responsibility of the case.

I did not see it again until the 24th of the same month. The eye was then quiet. Diligent search failed to discover any sign of the foreign body. The yellowish mass in the anterior chamber had also disappeared, so that I was able to look down into the bottom of the chamber to the utmost limits of the iris. The patient stated that the day before something had scratched the eye "right smart." He said he had rubbed the eye vigorously, after which the irritation ceased. At this time the eye was so quiet it seemed the case had reached its termination. No indication existed for further treatment. However, I requested him to call occasionally and report.

On the 5th of March, nine days later, he came to the office exulting in the possession of the foreign body. He said that the day previous, feeling something scratching the eye, he rubbed it with a pledget of cotton, thereby removing the point of irritation to the inner canthus. Removing some secretions which had gathered there, he found in its midst a small piece of bright copper which I at once recognized as the foreign body that I had seen in the anterior chamber. This was found to be a flat piece of copper of the thickness of writing paper; its side being $1\frac{1}{2}$ mm. in length, rather rough in fracture, one edge slightly turned up. The eye was quiet and presented the following appearance:

No ciliary injection. In the lower inner quadrant this membrane presented a slightly increased curvature which portion was traversed by a crescentic nebula having its extremities at the limbus and surrounding the dark area where the pigment had infiltrated the cornea tissue. From a point in the horizontal margin of the anterior capsule, just to the nasal side of the centre of the pupil, there was seen a white band which ran downward and forward reaching and becoming adherent to the cornea at the position of the black area described. To this band the torn edges of the iris had become adherent drawing that portion of the iris forward, encroaching upon the depth of the anterior chamber.

A few days later, when the effects of the mydriatic had

passed off, the pupil became eccentric, so that the band reached the upper margin of the pupil, dividing that space into two unequal portions. Sight was 15/XL.

This case I believe to be quite unique in that it is one of spontaneous expulsion from the anterior chamber of the eye, of a foreign body which had passed entirely through the cornea and was freely movable within the anterior chamber; and also unique in its expulsion without ulceration or other destructive change. That it must in entering have passed entirely through the cornea and become free from that tissue, is evident by a comparison of the minute size of the offending body and the distance from the point of entrance to the point of injury in the iris, this being in a vertical direction, at least 5 mm. Assuming, as probably was the case, that the humor had not been lost, the distance between the point of entrance and the point of injury to the capsule must have been considerably greater. It is probable, therefore, that the foreign body was driven entirely through the cornea, traversed the anterior chamber, cut the sphincter iris, lacerated the anterior capsule, after which it fell into the anterior chamber, where it had become surrounded by a mass of lymph; that the lymph had been ultimately absorbed and that the foreign body had made its way—whether at the exact point of entrance or not it is impossible to say—by absorption of the tissue in front of it, through the cornea, finally escaping unassisted from the eye.

From the limited opportunities which I have had of consulting our literature, I have been unable to find a similar case. Norris and Oliver mention that “very minute foreign bodies are sometimes spontaneously extruded from the eye,” this taking place during attacks of inflammation when the minute body ulcerates through its point of entrance. In most all of the cases referred to, the inflammation was destructive and fatal to the eye.

Since writing the above, my attention has been called to a case of “Spontaneous extrusion through the original point of entrance in the corneal membrane,” in a report by Dr. Oliver, published in the ANNALS OF OPHTHALMOLOGY for April, which presents more points of similarity to the case which I report than any other that I have found

A CONTRIBUTION TO THE SUBJECT OF PRE-
VENTIVE OPHTHALMOLOGY IN OUR
PUBLIC SCHOOL SYSTEMS.*

By H. McI. MORTON, M. S., M. D.

OCULIST AND AURIST TO THE ST. BARNABAS AND NORTHWESTERN
HOSPITALS, MINNEAPOLIS.

In the winter of 1893-94, with the approval and by the request of our superintendent of public schools, Mr. Jordan, the writer commenced some investigations in order to ascertain, if possible, to what extent the subject of ocular hygiene had received attention in the public school systems of the United States. The object of this was to obtain such information as might be of assistance in the application of some practical system of ocular hygiene in our schools in Minneapolis. With this object in mind, the following letter was addressed to about forty superintendents of public schools in the larger American cities:

MINNEAPOLIS. Minn., Jan. 22d, 1894.

DEAR SIR:—At the request of the superintendent of public schools of our city, I am undertaking a careful investigation of the plans adopted by the various cities for the protection and care of the eyes of the public school children. The importance of this subject is evident to all, and I shall beg your assistance in my endeavor to ascertain some facts.

In case there is no regular medical examiner to refer this paper to, I trust you will answer as far as possible the questions I desire to have answered:

1st. Has the city any system as to the examination of the eyes of public school children? If so, how frequently are these examinations made, and what is their scope? (To be answered by the oculist, if there be one.)

2d. Are the teachers instructed to watch for very near-

*Read before the Minnesota State Medical Society, June 16th, 1898.

sighted children; or children complaining of their eyes?

3d. As to light, does it come from above, from the left side, etc., and what suggestions would you make as to the position of the pupil to the windows? As regards intensity of light, how regulated? Any particular color on the top of the desk; color of school room wall?

4th. Position of the pupil, height of desk and the seat? Do you try to prevent the bending over of the head by any special arrangement of the desk or chair?

If you have instituted any new ideas in your school system, or any separate school, will you speak of it; or, in fact, offer any suggestions that your experience may suggest. If any special plan relative to the lighting of the schools, or any one school is being tried, may I ask you to speak of it and send me a rough sketch?

Unless I receive from you answers to my questions, the result of my attempt to investigate these important matters will fail, so I trust you may give this careful attention, and reply as soon as possible.

Very respectfully,

Dayton Building,

H. McI. MORTON.

While not unmindful of the fact that in a few cities some attention had been paid to the correction of errors of refraction of school children, it was not my conviction that a well defined and systematically applied plan of *truly preventive* ophthalmology existed in any of our school systems. I deem it proper in this early portion of my paper that I differentiate between what I term "preventive ophthalmology" and the subject spoken of as errors of refraction.

By preventive ophthalmology (ocular hygiene,) I mean the elimination of all such factors about the school children as may tend to irritate the eye, and, thereby, make manifest by symptoms latent difficulty; or, on the other hand, give rise to eye disorder that had previously not existed. We understand by correction of errors of refraction the fitting of glasses to the eyes of such children as have trouble already existing, or induced by a lack of attention to ocular hygiene. That the attention to abnormalities in the refraction, accommodation and muscular balance of the eye is in one sense preventive cannot be

gainsaid, and it will be, subsequently, dealt with *as one* of the preventive measures worthy of attention; but it must appeal to the reader that the placing of such favorable conditions, and the careful elimination of all such as are unfavorable, about the small pupil in our schools as may to the fullest extent possible *prevent* the manifestation or development of such error calling for the fitting of glasses or complete debarment from study, is in the truest and best sense of the word strictly preventive. The elimination of such factors is not only possible but practicable. An unfortunately large percentage (about 22.4) of children presenting themselves as candidates for school instruction have errors of refraction, or other ocular abnormalities. Now, it is not to be supposed that we are to place glasses upon all of this horde, for by the application of rational ocular hygiene to the school room and its contents, a large portion of the 22.4 per cent. will be just as well off without glasses, since a large part of this defective class have not complained, as yet, of their eyes.

It is the duty of the school board to have surrounding this class such proper conditions as will not provoke this tendency to a necessity for glasses.

Again, of the children who begin school life, there are many who, while not having on entrance such errors, are yet in such a general plastic state of development—the tissues yielding readily as they do in the young—that ocular trouble of a serious nature *may develop during attendance at school*, if the eyes are not cared for, and in those with already existing errors this damage, by further irritation, is obviously greatly accentuated. Thus, if I make myself clear, it has been to attain to such knowledge from other school systems, as other sources, as would assist in carrying out rational and practical plans to aid in the placing about the pupils such favorable conditions as to *prevent* in the fullest sense eye trouble in the school room.

Since in this matter no very great amount of work has been done in our cities, except in a very general way, and since the information desired was to be largely obtained from non-medical sources, the questions were suggestive rather than technical.

Almost without exception these letters received attention. In many cases the answers clearly indicate a desire to hasten the attainment of the plans suggested by the inquiry, and gave much information relative to experiments made or being made. In others a desire was expressed to adopt some such measures, and a few only showed lack of appreciation of the importance of the subject.

A brief history of this movement for reform in school room hygiene, as far as it bears upon the eyes, may not be out of place, and will occupy but little space. Although it seems the subject of school desk reform (a matter intimately connected with this subject,) started in this country about 1860, there was little attention, however, given to it, the interest seeming to die out, while in Germany—where scientific questions are studied with a pin-head concentration characteristic of that country—the question was taken up and studied in its most scientific bearings, and the practical results applied to the German school system in a regular and systematic manner. But even before this time—in 1841—we find in the report of the Boston School Board Committee “that the schools are too crowded and the desks improperly constructed;” and also that “public attention is not called to this subject, because the connection is not perceived between the cause and effect; but if the committee could only realize the extent of the evil, and have brought before their senses in some perceptible form, the consequences of the violation of the natural laws, we believe that a reform would be insisted upon, and no consideration of economy would be allowed to stand in the way of it. Indeed, a truly enlightened economy, no less than higher motives, would make the health of your children a matter of first importance and remove and alter everything that operates upon it.” And this, in 1841! Truly, every word of this passage should be italicised, for it is, every word of it, of the most burning importance.

In a most valuable little book, published in 1880 by Dr. D. F. Lincoln, he says: “There is no hygienic point where the teacher can render more distinct service than in relation to the eyes of his scholars. The functions of this

organ are so dependent for their perfection upon a thoroughly sound condition of health, that a complete account of their relations would bring us in contact with most points of hygiene. But of all public servants, the teacher ought to be the best able to assist the children in avoiding them.'

That the necessity of attention to the eyes of school children has not failed to be agitated from that time (1841) to this, and that the dangers following neglect have been pointed out, we also may see in these remarks in a paper by Dr. Lee before the American Academy of Medicine, in Philadelphia in 1849. Dr. Lee says: "Eyes originally sound are ruined in school by methods and conditions that are entirely avoidable. Among these may be noted the holding of the books too close to the eyes, the use of fine print in school books, the prolonged use of the eye, insufficient and badly managed lighting, use of the eyes too soon after convalescence from exanthemata, the use of polished blackboards, irritation of the conjunctiva from chalk and dust, and many others. * * Hours of eye study should be diminished, and more teaching should be done by illustrated lectures. Finally, more care should be taken to stamp out the infectious diseases, which so often leave impairment of vision after recovery."

While agitation is a good thing *if we stop there*, as has been too largely the case, the agitation has done little good. Definite application of a regular system, embodying the principles indicated in these remarks, is demanded. In the answers to my inquiries I observed the express desire to have some such plan in action, but no definite expression of the results obtained by an already adopted plan.

In Germany, however, it has been different. Dr. Cohn, professor of ophthalmology in the University of Breslau, in 1865 examined the eyes of 10,060 school children. In his work on the "Hygiene of the Eye in Schools," he says: "When, in 1865, I had studied in Fahrner's admirable work, and had begun my examination of the eyes of the Breslau school children, the question pressed itself upon me: How far may the old desks in our schools be answerable for the origin and development of short sight?"

"To obtain an answer to this question, I first of all measured the height of 10,060 children of the 156 classes examined. I then measured the desks with reference to desk height (back and front), desk width, form-height form-width, difference and distance between desk and form, between form and foot board, etc. I thus found that these desks were *opposed to every reasonable hygienic requirement*, and were set up quite arbitrarily, and without any reference to the height of the children in the classes. Pupils 3 feet 6 inches and 5 feet 2 inches in height sat at the same desk.

"But, apart from this fundamental error, I found that scholars, even when the desk was suited to their height, *were forced by the old forms (seats) to stoop forward and bring the eye very close to the writing*. That is just how myopia can be produced and increased."

While this matter has received much attention, as a practical working plan in Germany, there are a few cities in this country where quite a good deal of attention has been given to the care of the eyes of the school children. In a number of the cities adjustable desks are being used, but not throughout the entire system. In a great many of our cities, however, sad to say, "very little attention is given to the matter." Those cities whose school boards are lacking in interest and knowledge in the matter are now, or soon will be, much behind the time, for *it is a supreme duty devolving upon any school board to attend to it, that the children placed under their care shall, at best, not suffer physical deterioration in acquiring mental development*.

Mr. E. M. Hartwell, in his report to the Boston School Committee, in 1894, aptly says: "We ought to aim, not merely to avoid injuring the health of pupils while carrying on their instructions in our schools, but to increase their physical health, strength and beauty."

Enough, then, as to the history and importance of the subject. *Ocular hygiene in our schools largely resolves itself into a matter of eliminating all factors, about the pupil and his work, which cause strain, fatigue and congestion*. This is the matter in a nutshell, for it is these factors which excite trouble in eyes predisposed, and develop trouble in

previously healthy eyes. We recognize three principal abnormal focal states of the eye. First, "far-sight," or hyperopia; second, astigmatism; and the third, "near-sight," or myopia. The first two are almost without exception congenital conditions, the latter almost without exception an acquired condition. Far-sight and astigmatism *with symptoms* should have glasses fitted at once; without symptoms, and if low in degree, attention to ocular hygiene.

It is of myopia that I desire to speak more in detail. Dr. Fuchs, one of the most eminent European authorities, says: "Myopia is only exceptionally congenital, elongation of the eye in that case existing at birth. The rule is that myopia develops in the youth at the time when, as the whole body is growing rapidly, considerable demands are at the same time made upon the eyes by school life or by work."

Arlt demonstrated in 1854 that myopia consisted and depended upon a stretching of the posterior part of the envelopes which form the eye. He showed that in many cases this was caused by such factors as I have spoken of, causing congestion. It is this congestion, resulting from improper surroundings, which form the chief element of damage. Myopia is a disease, it cannot be cured, and often cannot be arrested. Fuchs states: "It is the schools which are often the main hot-bed for the propagation of nearsightedness." While I grant at once that this holds better for the state of the eyes as found in Germany and Austria, yet it is still true to a large extent in our own schools. Fuchs further states: "In savage nations nearsightedness no more occurs than it does among children. Again, in the lowest order of schools—the common schools—there are extremely few nearsighted persons, and the same is true of the rural population, whose education does not, as a rule, get much beyond the common school. The most dangerous to the eye is the high school. It is there that myopia first develops and there increases, both as regards its intensity and as regards the number of myopes in proportion as we ascend the classes."

The fact that myopia increases as we ascend in the classes is significant, and points to the proper means for

its relief.

Conditions favorable to irritation and congestion of the eyes in our schools are:

(a) Improper position of the head, due to faulty desk and bench construction.

(b) Irritation from direct light, shadows, glare and reflected light.

(c) Artificial light.

(d) Misplaced desks and blackboards.

(e) Untinted walls.

(f) Excessive work.

(g) Improper size of type, poor maps, etc.

(h) Home study at night, and many other factors.

For convenience I have arranged the subjects of most importance in the consideration of ocular hygiene in schools, under several heads and subdivisions:

(A) Relative to Light:

(a) Proportion of wall space devoted to windows.

(b) Color of walls.

(c) Direction of light.

(d) Artificial light.

(B) Relative to Desks:

(a) Attention to desk and seat construction.

(b) Position of desks as regards blackboards and windows.

(c) Amount of floor space allowed each desk.

(d) Material on slope, or top of desk.

(C) Relative to Periods of Work and Rest:

(a) Length of continuous application to study in the different grades.

(b) Frequency of periods of ocular relaxation.

(c) Home study.

(d) As to regular distraction from work while at desk.

(D) Relative to Type:

(a) Size of type.

(b) Distance between lines.

(c) Length of line.

(d) Quality of maps.

(e) Greek and German type.

(E) Relative to Blackboards:

- (a) Position as regards pupil and windows.
- (b) Reflection from polished blackboards.
- (c) Cleanliness.
- (d) Legibility of writing on boards.
- (e) Chalk dust as an irritant.

(F) Relative to the Correction of Errors of Refraction and Accommodation.

Relative to Light.

The German requires from three hundred to three hundred and fifty square inches of glass to each pupil. A few of the reports show that attention has been given this matter in our schools, and a ratio of $\frac{1}{5}$ to $\frac{1}{7}$ glass to the floor space, which is near the German standard, has been adopted in all the new buildings. This is true in Albany and Philadelphia, and a few other cities, while in some, as in Providence, the ratio is as high as $\frac{2}{3}$. In a properly constructed and situated school building the ratio of from $\frac{1}{5}$ to $\frac{1}{7}$ glass to the floor space in each room is in accord with the best authorities.

In a most interesting statistical report sent me from the superintendent of public schools in Denver, I note in a list of fourteen schools the ratio of light surface to floor varies from 1 in 5 to 1 in 12, or an average of 1 in 9, this average being much increased by three small schools of a seating capacity of only 120 each, in which the ratio of light surface to floor space is 1 to 12. This ratio of the light surface to the floor area must be influenced by locality to no inconsiderable degree. In portions of the United States, as in our own northwestern cities, or in Denver, for instance, where I am informed "we have no cloudy days," and also where school buildings are not, as a rule, crowded among a row of buildings as high or higher, which obstruct the light to a practical degree, the ratio of window space to floor space need be less than in other portions of the country, especially on the Atlantic seaboard, where cloudy days predominate and where the question of ground is such a desideratum as to place pub-

stated by Mr. E. M. Hartwell, in his report to the Boston School Committee, that I shall attempt no modification. He says:

"The cardinal points which are of main importance in school desks are four: the difference, the distance, the seat height and the desk slope.

"(1) *The difference*, that is, the vertical difference, between the desk and seat. The higher the desk surface the nearer it is to the eye of the straight-sitting child. The greater the difference the more the child will have to exert his accommodation. Now, the writing ought to be from 35 to 45 centimeters (14-18 inches.) from the eye, for that is about the distance of a child's eye from the elbow when hanging straight down, and the text of the school books should be easily legible at that distance. If, however, the distance is great, so that the elbows have to be considerably raised in writing, as is generally the case in our Boston schools, the shoulders will not hang from the body, but the body from the shoulders, and the writing hand will be too near the eye.

"(2) An exceedingly important correlative of the difference is the horizontal *distance* between the desk and form. In the right arrangement of distance lies the kernel of school desk reform. The greater the distance the more the body will have to fall forward of the seat in order that the arms may reach the paper, and the more will the head be obliged to drop and get near the writing. Thus, whenever we intend to sit upright at a table for a considerable time, we instinctively push the chair so far under the table that the table's edge is vertically over the chair's edge, or, if possible, overhang it by an inch. *For the upright position of the head, therefore, distance must be nil, or, still better, negative.*

" * * * I once proposed a minus distance of one inch, but after further observation I think that the upright position is sustained still longer when the thigh is supported still further toward the knee, and, therefore, I agree with Buchner, who requires a minus distance of two inches.

"Here every inch is of consequence. No physician has ever opposed the requirement of nil or minus distance

lic schools in the shadow of surrounding buildings. In the former the ratio of $\frac{1}{10}$ might be practicable, whereas it would be insufficient in the latter.

Judging from the figures I obtain in the reports, and from the German standard, the ratio of about $\frac{1}{5}$ to $\frac{1}{4}$ of light surface to floor space is one that should obtain, at least. The position of the windows in a school room is of the most vital importance, quite equaling the question of their size. The direction from which the light comes to the pupil at his work is worthy of much attention. It is so well agreed as to be quite as well known to the laity as to the medical profession, that the proper direction from which light should come is the left. I am informed that in the German school system this fact is so well appreciated that the placing of windows in any other side of the room but the left is prohibited. That the light coming from the right is any the less efficient than when coming from the left *in reading* I am not aware, but one has only to try the experiment himself *in writing* to perceive how much more irritating and injurious the right light is than the left. A shadow is cast from the pencil in the first position, which is very annoying to the eye, and in a combination of lights from the right and rear a double set of shadows prove more irritating still. The worst direction that light can come from is the front. Of course, no new school room would be so planned, however, in these days, and all old rooms having such light should be vacated. Faulty direction of light induce shadows, and also glare, which, if not actually painful—as they commonly are—irritate the eye and detract that much from its strength to attend to the normal demands to be made upon it. Windows from the rear are very aggravating to the eyes of the teacher, and cast the entire shadow of the pupil on his field of studies.

Lincoln states that “the most agreeable light to write by is one that comes from a pretty high point and strikes the page at a wide angle. An ordinary window will not give such a light, but still may be found very suitable if placed on the left of the scholars. Light entering horizontally has hardly any value for a student who has to use a flat desk. The experiment may easily be made by

any one. Hence, the lower panes of windows are of little use as admitting light for study. The upper parts are by far the most important, because they throw the light to the opposite side of the room, and also light up the ceiling, which is in reality a principle source of light."

This author thinks the area of light surface to floor space should be more than one-sixth.

I am surprised to find that in some of the schools, in the large cities, that light comes from the left and right.

Almost all, however, report light from the "left," and even in those mentioned as having it otherwise there is an expressed desire to have only light from the left. In most school rooms shades roll from the top, but the light could be better regulated with shades that rolled from both top and bottom of windows.

In almost all school systems in the country the walls of the school rooms are tinted, and with neutral tints, yet no particular attention has been paid to the shade or color, excepting in a few instances. Where attention has been paid to this, a gray or "blue-gray" has been adopted as the best. All school walls should be tinted, as the glare on bright days is most irritating to sensitive eyes. "The sun's rays should never fall on the pupil's work." The ceiling may remain white and act as an illuminator. Lincoln recommends that the walls be tinted a "bluish or semi-violet or neutral tint."

Artificial light is always a bad light for sensitive young eyes, and should be avoided. Young children with myopia should never work by artificial light. In most of the school systems it is provided, but it would be better if it were not so, for the younger grades, especially. If a morning period of study only were required, the necessity for artificial light would be, in most instances, avoided; and related to this is the additional argument of the eyes being much more capable of work at this time than in the afternoon. In eyes adjudged in an irritable state, or predisposed to progressive ocular disorder, pupils should be discouraged from home study at night. At the time when the tissues are most yielding—especially the eye, which at this stage has greater focal strength and greater tendency to yield in its envelopes than at any other period of life—

it is a great mistake to force the child. Through such abuses conditions are frequently brought about which not alone pain and worry the child, but induce such changes as may very seriously impair the usefulness of the child in the future and debar him from callings that he otherwise could have entered. It would seem very proper that some non-reflecting material, as for instance green baize, should cover the desk top.

Relative to Desks.

It is unnecessary to accentuate the importance of this subject, being, as it is, one of the most important factors to consider in the hygiene of the eyes. The study of the development of myopia is intimately connected with the study of school desk reform. Cohen, in his study of seating in its bearing upon myopia in the public schools, states that "*in every school the number of short-sighted children increased from class to class.*" He attributed this to improperly adjusted desks.

In the reports sent me from the various schools there is shown a very general appreciation of the vital importance of this subject. I find that the number of sizes of desks varies from two to four. The general use of adjustable desks is decidedly the exception, although this is the only proper desk to use. As it is complained that no perfectly adjustable seat and desk is manufactured, there is undoubtedly a prolific field for the ingenuity of inventors and school boards. Two, or even four, sizes of desks are inadequate to the needs of the school system, in which the sizes of the school children run from the small tots in lower grades to the over-grown boy in the high school. Varrentrapp states that eight sizes are necessary to meet the requirements. The solving of this problem is not to be found in any given number of sizes of desks, *but in the complete adjusting of each desk to the pupil occupying it.*

In so far as the eyes are concerned, the important point in desk construction is that the position of the head, while the child is at work, shall not be one favoring excessive strain upon the accommodation or inducing con-

gestion of the head and eyes. The cardinal points relative to desk construction are so admirably and so briefly * * * the opposition has come solely from individual teachers.

“(3) *The height of the seat.* If the legs are not bent at a right angle at the knee, and the feet resting with the entire sole flat upon the foot-board or floor, the feet must be left dangling in the air. Then the child will grow tired. He tries to reach the floor with the tips of his toes, at least, and in so doing he bends the thigh downward, slides forward on the edge of the seat, and presses his chest on the edge of the table. The necessary result is a further collapse of attitude. (In all this we are leaving quite out of account the hindrance to breathing and compression of the intestines.) *The height of the seat must, accordingly, be equal to the length from the knee to the sole, that is, $\frac{2}{3}$ of a child's height.* The knee must be bent at a right angle. No attention is paid to these proportions in the old school desks.

“(4). *The slope of the desk.* We can read easily, without any stoop of the head, from a book placed *vertically* before us. If the book slopes back at an angle of 45 degrees with the horizontal reading is equally easy, because the eyes can be directed downward without bending the head forward. But if the book lies flat and the reader sits upright the eyes are turned downward very far. This continued for any considerable time is very trying, and so we prefer to bend the head forward. It follows that the desk must not be horizontal, but sloped. A slope of 45 degrees, however, is not to be recommended, because it would make writing difficult, and the writing materials would fall down. A slope of 1 in 6 is best. The old school desks are all flat and, therefore, wrong.”

I wish here to speak of a factor in the production of ocular irritation that has not, so far as I am aware, been considered heretofore in relation to this subject. This was brought to my attention during the past summer in my brief sojourn in Paris, by Dr. George Bull. The latter has written a paper worthy of consideration, in which he claims that pain may be induced by the pressure of the eyelids on the cornea. In extreme downward positions

of the eye this lid pressure is increased. He demonstrated to me that this lid weight causes a wrinkling of the superficial layers of the cornea, which interferes with the refraction of rays, and thus may induce asthenopia. He advises all of his patients whose eyes are sensitive to use, to hold the book *above* the level of the eyes. He has had many severe and obstinate cases get relief in this way. Apropos to this, desks have been made with a hinged lid which may be turned up at an angle of 40 degrees for writing.

I have dwelt at some length on the subject of desk construction in its relations to the eye, but its practical bearings on the matter is so manifest that I think it justifiable in even so brief an article as this.

Relative to the Periods of Work and Rest.

In the younger grades it would be far better to restrict all study to the morning hours, and advise no study by artificial light at home. The reports indicate in the low grades that from 3 to 5 hours are required. In the higher grades usually about 5 hours. More than 3 hours for very young children is not for their best interest. It has been found by experiments conducted in England that children who attend school three hours made as rapid progress as others attending six. Such being the case, it is better that the three additional hours in the latter case be spent in play and exercise.

That children are started to school at too early a period in many instances there is no doubt; as to the proper age, however, there is much difference of opinion. Lincoln believes that "the kindergarten does not injure a child of 4 years, unless carried to the point of over-excitement," which I believe is not often done. The common primary school, however, is decidedly objectionable. It takes very young children (6 years of age,) and compels them to remain twice as long as is good for them.

A school conducted by set lessons and recitations should not receive children under 7 or 8 years of age. Dr. Tiffany thinks 10 not too late.

Not only should the school hours be carefully adjusted to the strength of the pupil, but there should be judicious

intervals during school hours for relaxation of the muscles of the eyes. During study, not only is the muscle of accommodation taxed, but also the extrinsic muscles attached to the globe are exerting pressure upon this globe, that in easily yielding eyes may be an important factor in producing myopia.

In all grades the pupil should not be permitted to have long continuous periods of work. The late Dr. Edwin Chadwick of England, who was an eminent, probably the most eminent authority on the subject of the number of hours that a child should be allowed school works, says: "At the age of from 5 to 7 he can attend to one subject, a single lesson, for fifteen minutes; a child from 7 to 10 years of age, about twenty minutes; from 10 to 12, about twenty-five minutes; from 12 to 16 or 18 years, about thirty minutes." These remarks do not hold so properly, perhaps, to the children of our country schools; the term of study being shorter, and the children more robust and less sensitive to faulty conditions than the city school children.

Relative to Type.

This is a subject of great importance. Dr. Tiffany of Kansas City, who has given it attention, says that the type should not be less than 1.5 mm. The distance between the words not less than 5 mm. The distance between the lines 3 mm.. and the length of line not to exceed 100 mm.

This question of type may be resolved into quite a definite and scientific matter. Snellen determined the normal acuteness of vision to be the power of distinguishing letters subtending an angle of five minutes. In order to determine the size that a letter should be at a given distance (for instance, the distance from the desk to the child's eye when in normal condition), multiply the distance by the tangent of the angle of five minutes. Dr. James Wallace of Philadelphia, has constructed type on the basis of four minutes angle, which, although possibly more accurate, is not to be preferred over the former for school children.

The subject of maps should receive attention, for fre-

quently the print in some maps used is not fit for the adult eye, and much less for the eyes of young children.

Relative to Blackboards.

Blackboards should be covered with a dull, rather than a polished material, and should be kept scrupulously clean; on this point Dr. Dowling of Cincinnati, lays great stress.

The average writing on a blackboard should be seen at thirty feet, and not beyond, with ease; thus, the number and position of the boards, as regards the seats, should be a matter of consideration. In this respect movable blackboards may have some advantage. It has been suggested that the chalk dust may prove a source of irritation to the conjunctiva.

Relative to the Correction of Errors of Refraction.

Since throughout this article so much has been said upon this subject, little more need be added. I trust I have demonstrated how intimately connected in the relation of cause to effect the previous factors discussed stand to errors of this kind. All children complaining of their eyes and needing glasses should be fitted at once, be it at the beginning or during their course of study in the public schools.

315 New York Life Building.

ABSTRACTS FROM RECENT GERMAN OPHTHAL-
MIC LITERATURE.

Quarter Ending October 1st, 1898.

BY

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Retinal Hemorrhage in Blood and Vessel Disease

AMMAN, E. (*Beitrage z. Augenhkde.*, July 23, 1898.), presents an exhaustive study of this condition in a 70 pp. article, describing in detail 44 cases. He divides the condition into two groups:

- I. Primary blood with secondary vessel changes.
 1. Senility.
 2. Lues.
 3. Alcohol, tobacco and lead toxication.
 4. Nephritis and diabetes mellitus.
 5. Icterus.
 6. Sepsis.
 7. Scorbutus, purpura and morbus Werlhöfii.
 8. So-called spontaneous and recurrent hemorrhages in young individuals.
 9. Acute and chronic anemia, pernicious anemia and leukomia.
- II. Primary circulatory disease, secondary blood vessel wall disease.
 1. Heart disease.
 2. Active hyperemia.
 3. Local circulatory changes (choked disc, glaucoma, myopia, etc.).

In the eye clinics of Zurich from 1862 to 1894 and in Prof. Haab's private service from 1880 to 1894 there were

60,000 cases received of which 90 came under these groupings; of these there were:

1. Senility	- - - - -	57
a. General retinal bleeding	- -	13
b. Special macular bleeding	- -	11
c. Venous thrombosis	- - - -	33
a. Of the trunk	- - - -	20
b. " " branches	- - - -	13
2. Lues	- - - - -	7
3. Alcohol and tobacco	- - - -	7
4. Scorbutus	- - - - -	1
5. Spontaneous and recurrent bleed-		
ing in young persons	- - - -	10
6. Anemia.	- - - - -	8

In the senile cases from atheroma most patients were over 60 years of age; 13 being country people who had always been in good health. The prognosis for sight is not bad, as in five of his cases relatively good vision was recovered. The therapy is prophylaxis. The prognosis of macular bleeding is bad; treatment is rest. Prognosis of venous thrombosis is not very good; half of the cases recover some vision. Therapy is darkness, leeches, hot foot baths, iodid of iron, ung. hydrarg. ciner., massage and amyl nitrite. Syphilis usually leads to vessel changes which both macroscopically as well as microscopically are readily distinguished. Luetic retinal hemorrhage is characterized by relapses. The history of his cases does not allow of a favorable prognosis. In most cases the history of tobacco, etc., abuse was connected with arteriosclerosis.

Spontaneous and relapsing retinal hemorrhages occur in young persons between 20 and 30 years and ophthalmoscopically show large extravasations in and under the retina, most commonly in the neighborhood of the optic nerve or macula. The occurrence is as common in both eyes at one time as in one alone. Anemia causes metastatic changes in the vessel walls and in light cases the hemorrhage seems to be largely serious which causes edema of the optic nerve and retina; in severe cases retinal apoplexy occurs.

Primary circulatory disease can seldom be designated

as an etiologic factor in the production of retinal hemorrhages, such conditions are usually complicated by arterio-sclerosis, etc. Active hyperemia may cause retinal hemorrhage, especially that following disturbances of menstruation.

Ultimate Results of Treatment for Glaucoma.

SIDLER, HUGUENIN, (*Beit. z. Augenhkde.*, June 18, 1898.) occupies this whole number of the *Beit.*, with 78 pages in a careful study of 76 private patients of Haab's regarding the results of operative and medical treatment for glaucoma in order to determine the question of cure of glaucoma by iridectomy, sclerotomy and myotics.

The cases came under the following heads:

1. Acute and chronic inflammatory glaucoma (16 acute, 5 chronic).
2. New inflammatory and simple glaucoma (36 cases).
3. Hemorrhagic glaucoma (10 cases).
4. A group which were only treated by myotics.

A history of the cases with immediate and subsequent results are given in detail with the following conclusions:

62.5 per cent. of acute glaucoma and 60 per cent. of the chronic form was entirely cured by operation, more than half of the cases by iridectomy. In 8 the relapses were so slight as to be relieved by myotics and only two cases were incurable.

It is very seldom that a poor result occurs after iridectomy in glaucomic inflammation (acute and chronic) as well glaucoma simplex. 91.47 per cent. of the cases regained or retained the vision they had before operation. The largest percent of acute inflammation or chronic glaucoma need early iridectomy or sclerotomy. Myotics are more useful for after-treatment. The better the sight and the fewer the complications before the operation the better the result. This is as good for glaucoma simplex as for simple inflammatory glaucoma. In 77.42 per cent. of the cases after iridectomy and 60 per cent. of cases after sclerotomy no return of tension took place and in about the same percentage the visual acuity was restored or bettered. Iridectomy seems to be preferable to sclerotomy. In hemorrhagic glaucoma the progress is much worse than in other forms. Sclerotomy seems to be preferred to

iridectomy in hemorrhagic cases. 20 per cent. of the cases were cured and 40 per cent. recovered some vision. In no case was the glaucomatous process brought to a standstill by the simple use of myotics, although in 33.3 per cent. the visual acuity was restored for a long time but the principal evil, the increase of tension, could not be permanently relieved and this caused blindness sooner or later. The author states that iridectomy or sclerotomy cannot be termed a definite and permanent method of treatment and that every glaucoma patient should remain under medical observation for a very long time in order to prevent relapses which may be dealt with by sclerotomy or myotics. The more quiet and less anxious the patient can be after the operation and the better his general health, the better the prognosis for permanent cure and retention of vision. A certain amount of sleeplessness is, however, pathognomonic of chronic glaucoma. It is not sufficient to test the tension only during the visits of the patient to the office but this should be done several times a day by the patient.

The influence of menstrual periods and especially of the climateric is unfavorable. There is often found normal tension during the day and at night the eyeball becomes harder. Thus the glaucomatous process and excavation proceeds more rapidly at night.

Histology and Development of Lenticonus Posterior.

BACK, S. (*Arch. f. Augenhkde.*, XXXVI, 1 and 2, 1898.), makes a histiological report of the eyes of a young rabbit with lenticonus. In one eye he found a complete rupture of the posterior capsule of the lens; the posterior part of the lens projecting backward formed a blunt cone against the optic papilla; this was covered with delicate fibers which connected the papilla with the hyaloid artery and membrana vasculosa lentis; there was no rupture of the capsule in the other eye but it was much thinned. These fibers also composed a cone. In the middle of the post. pole there was a fissure in the cortical substance filled with detritus resembling a fusiform cataract; the remains of the hyaloid were not found.

Bäck states that lenticonus is the product of changes occurring in the eye during the disappearance of the hya-

loid artery, causing a weakening of the lens capsule at the post. pole, which becomes very thin; having caused the rupture in the one eye of this case, and in both conical projections of the post. surface of the lens.

Retrochoroidal Hemorrhage After Cataract Extraction.

BLOOM, SELINA, of New York, from the University Eye Clinic, of Leipzig, with addendum by H. SATTLER (*Arch. f. Opth.*, XLVI, 1898), contributes an able article of 60 pages on this most interesting subject, illustrated by two plates and full reference to the literature. About 100 cases of this unfortunate event have been described in the literature and heretofore have been supposed as noted by Spalding to occur in uncomplicated as well as complicated cases. The event has usually been observed only in one eye even when both have been operated upon at one time. In only four cases were both eyes destroyed by retrochoroidal bleeding. The hemorrhage occurs earliest immediately after corneal incision but generally directly after the operation, and seldom several days afterward. It is usually attended by great pain and opening of the wound, and bleeding which stains the bandages; the vitreous and ocular contents are usually extruded. In a few cases it has been recurrent. Most operators enucleate at once as the eye has lost its function and in many cases goes on to panophthalmitis.

Most authors think the cause is the rapid reduction of the intra-ocular pressure and arteriosclerosis, but we must look farther as this is very common in cataract cases. Bloom was able to make anatomical examinations in 3 cases of retrochoroidal hemorrhage after normal extraction and in a fourth in which the bleeding occurred an iridectomy for glaucoma.

I. Woman, aged 29. Discission operation followed later by extraction with iridectomy and hemorrhage; patient died a month later from abortion. In this case there was great change in the choroidal veins combined with general change in the circulation.

II. Man, 63 years old. Incipient cataract. Foerster's maturation operation followed about two months later by extraction, retrochoroidal bleeding and enucleation of

the eye. In this case there was choroidal varix, due to long standing disease of the choroidal veins.

III. Man, 51 years old. Extraction with iridectomy followed next day with prolapse of ocular contents and retrochoroidal bleeding and enucleation 12 days later. This case showed uneven enlargement of the veins and cellular infiltration in their neighborhood.

IV. Woman, aged 67. Iridectomy for absolute glaucoma, followed five minutes later by bleeding and enucleation. Here were also found changes in the veins, exudate and cellular infiltration.

It seems from these cases from anatomic and physiologic grounds that retrochoroidal hemorrhage is venous and does not occur from the capillaries or arteries, and that in general it may be stated that only the veins are apt to rupture from increase of the blood pressure. Predisposing elements in the choroid, for this condition are phlebitis and peri-phlebitis. It is unfortunate that these conditions cannot be recognized before the operation by the ophthalmoscope in cataract cases, on account of opacity of the media.

Sattler in his appended remarks to his paper states that out of 3119 extractions, in the University of Prague, only 4 cases have occurred of retrochoroidal hemorrhage and quotes the literature to show that this occurrence is from O, 1912 per cent. to O, 476 per cent. of all extraction cases.

Histologic and Clinical Report upon Spindle and Capsular Cataract with Remarks upon the Genesis.

BACH, L. (*Arch. f. Ophth.* XLIII, 3, 1898.), reviews the literature of the subject and reports a clinical case, occurring in a girl aged 21, with moderate ectastic leucoma adherens in the lower temporal quadrant of the cornea; there was likewise anterior polar cataract from which there proceeded a thin cone of opacity in the substance of the lens in its axis, which did not quite reach the posterior polar capsule (fusiform cataract). There was likewise posterior polar cataract, excavation and atrophy of the optic nerve. In the left eye there was slight corneal opacity and rudimentary hyaloid artery, posterior polar cataract and spindle opacity in the lens. Bach believes

that these changes were more of a congenital nature than from the corneal perforation. In the case of fusiform and anterior polar cataract in rabbits, he considers that the formation is due to changes in fetal life in the development of the lens bud rather than to perforation of the cornea and inflammatory changes resulting therefrom.

In addition to Pergen's article on protargol (see abstracts in July number of the ANNALS OF OPHTHALMOLOGY, page 454) several others have appeared which show radically diverse opinions.

Protargol a Specific for Blenorrheal Conjunctivitis.

DARIER, A., of Paris (*Die Ophthal. Klinik.*, No. 7, 1898.), considers from a very large experience with protargol, that this is an antiseptic agent which produces quick and prompt healing of inflammations of the conjunctiva. On account of protargol causing absolutely no irritation, it can be used in a 50 per cent. solution without causing any disagreeable symptoms. As a rule the author permits patients to drop a 5 per cent. solution in the eye from two to four times daily; for local applications by the brush, he uses 20 per cent. to 50 per cent. solutions once a day or every other day, according to the grade of inflammation. For treatment of blennorrhea, he cauterizes the conjunctiva twice a day with the 20 per cent. solution. If this does not suffice, he uses a 50 per cent. solution as long as the secretion remains purulent. He makes applications twice a day and as it gets better increases the intervals. Protargol is of special benefit in those cases in which deep, wide-spreading ulcers occur. In inflammation of the lacrimal sac, protargol is the best application we have, as it speedily reduces the purulent secretion and does this without causing pain; injections may be allowed to pass into the nose without causing unpleasant symptoms. Protargol is not only a medicine for the cure of blenorrhea, but may be used as a prophylactic in a 10 to 15 per cent. solution, as is commonly done with the 2 per cent. solution of the nitrate of silve.

Protargol In Blenorrheal Conjunctivitis.

PFLUEGER, of Bern (*Ophthal. Klinik.*, June 5, 1898.), has used protargol in very weak solution for the treatment

of a case of blenorrheal conjunctivitis, immediately after the publication of Neisser's first paper on the treatment of gonorrhea by prolonged injections of the protargol; this was in a child of 15 days, the microscopic examination of the discharge from both eyes showing gonococci; the left was apparently less affected and was treated morning and night by installation of a few drops of a 1/4 per cent. *protargol* solution; the right eye being treated by large injections of permanganate of potash, morning and night at the clinic. At home both eyes were kept clean with boric acid solution. The eye treated with protargol became rapidly worse so that it was stopped in two days. The case was afterward treated by injections of from 1/4 to 2 per cent. solution of nitrate of silver and application of 4 per cent. solution of subnitrate of bismuth in vaseline to lids. Also the ulcer of the cornea developing in the left eye and the right going on to complete healing. (This quotation from Pflueger is cited by the editor as one of the adverse reports against protargol, the reader may, however, readily see the insufficient and improper trial given this remedy by Pflunger; the editor has been using this preparation two months in 10 to 25 per cent solution and so far has been much pleased with its effect.)

Observations Upon Protargol.

WALTER, O., of Odessa (*Ophth. Klinik.*, July 5, 1898.), comments upon the prevalence of conjunctivitis of various forms occurring in vicinity of Odessa due to unfavorable climatic conditions and filthy habits of the lower classes; over half of the ambulatory clinical material of the City Eye Hospital having conjunctivitis of several forms and over 30 per cent. of trachoma; from 60 to 70 per cent. of the daily visitors being trachomatous. Most of these cases have hitherto been most satisfactorily treated by nitrate of silver despite the production of argyrosis. Upon the strong recommendations of protargol, by Darier and Neisser, this preparation was used in over 50 cases of acute and subacute conjunctivitis, acute trachoma, etc., in one eye while 2 per cent. nitrate of silver was used in the other, and three cases of adult blenorrhea in 20 per cent. solution, which had before been treated with a 2 per

cent. solution. Most of the patients said the protargol solution was irritant, a few thought it was about the same and a couple of them said it was less. In one blenorrheal case the two eyes appeared the same after about two weeks treatment, but afterward the eye treated with nitrate of silver more rapidly improved; in the other case the improvement was so pronounced in the eye treated with nitrate of silver in comparison with the one treated with protargol that the latter was stopped. In none of his ambulatory cases had he seen any especial advantage of protargol over silver but indeed the opposite as the eye treated by protargol seemed to have more secretion, and had to be subsequently treated with silver nitrate; in the other cases in which Darier's advice was followed to give the patient a 5 per cent. solution of protargol to use at home, the patient declared that the medicine had not irritated, but the secretion was not controlled. Two cases of purulent dacryocystitis were treated with 20 per cent. protargol which controlled the secretion in three days, but a cure had to be effected by Königshöfer's method of massage. He had not seen argyrosis from protargol as the time had been too short, but thought that it might be produced as this condition arises from deposit of metallic silver in the tissues. He regretted that protargol was, unfortunately, of no advantage over the nitrate in the treatment of conjunctival diseases especially in sero-muco-purulent cases for which he esteemed the mitigated stick or strong solution of the nitrate to be the sovereign remedy.

Eneucleation Under Schleich's Infiltration Anesthesia.

✓ WEISS, L. (*Ophth. Klinik*, June 20, 1898.), recommends infiltration anesthesia for enucleation. He has had previous experience with removal of the eyeball under local anesthesia induced by cocain injections and also by simple installation of cocain. The latter is not sufficiently free from pain and the former is dangerous on account of absorption of the drugs. He reports five cases in which he successfully removed the eyeball under injections of Schleich's formulas for anesthesia. The operations were free from pain and cutting of the optic nerve did not give rise to the sensation of light. Infiltration is made by

injection of $1/2$ hyperdermic syringe-ful beneath the conjunctiva in several places around the limbus and by making deep injections toward the optic nerve. The use of the long curved needles of Schleich is recommended for infiltrating the nerve sheath. Edema ensues immediately after the injection but goes down soon after the operation. He thinks this form of anesthesia to be indicated in fresh ocular wounds and intraocular tumors except where the latter extends beyond the globe.

The So-Called Recurrent Erosion of the Cornea (Arit) and its Treatment.

HIRSCH, C., of Prague (*Wochenschr. f. Therap. u. Hyg. d.*, Aug. 21 and 22, 1898.), has carefully studied cases from Czermak's Clinic. These cases are ordinarily caused by slight injuries by the finger nail, straws or twigs. After complete healing has occurred, with regularly recurring intervals attended by considerable pain, the conditions relapses to that in which it was after the accident, a blister rises at the spot caused by raising of the epithelium which breaks down and soon heals, lasting from 5 to 8 days. The author thinks that the condition is one due to neuralgia of the corneal twigs of the trigeminus, especially as in his cases there was commonly an aura observed, of pressing or burning sensations in the eye.

The treatment consists in cocain collyria, firm compress bandage and quinine internally, which, if used during the preliminary stage of the aura, will prevent the attack. From the favorable effect of quinine in these cases, the author has been led to give it in cases of similar affections, such as herpes, with favorable results.

Acetylene Gas Light for Examination of Eyes.

APPENZELLER, G., of Rentlingen. (*Centralbl. f. Prak. Augenheilkde.*, May, 1898.) The apparatus recommended by the author for both focal illumination and ophthalmoscopy, is constructed according to the so-called contact system, and is composed of a 20 litre. gas-metre made of galvanized iron and uses up about $1/3$ Kg. of calcium carbide which furnishes about 100 L. of acetylene gas, and for the author's purposes, this quantity lasts about one

✓ week; the burner is about 50 candle power and gives an absolutely quiet, white light, particularly adapted to ophthalmoscopic purpose. He considers that this portable apparatus is absolutely free from danger, and has used it two months, many times a day, with the greatest satisfaction.

The Open Wound Treatment for Cataract Operation.

BORTHEN, JOHANN, of Bergen, Norway (*Klin. Monatsbl. f. Augenhkde.*, August, 1898.), has pursued the method of Hjort for small and large operations on the eyes for about a year. Just before taking up this method he had a curious experience with a woman of 84 years who was delivered of cataract from both eyes at one sitting, who tore the binocular bandage off several times, rubbing her eyes with a cloth, and went insane so that 60 hours after the operation, she had to be taken to an insane asylum 20 to 30 miles away. She traveled in 2d class compartments of a steamboat without any bandage on and yet one month later the eyes were quiet without acquiring infection and she was fitted with cataract glasses. This circumstance prepared him to take up Hjort's method. He thinks that movement of the eyeballs does not hinder the healing of the corneal wound and a fixation bandage is harmful, as Ferster says, "Better no bandage at all than a poor one."

Epilation of the eyelashes is very necessary as has been explained by Schjötz. In one case he did not do it and found that healing did not proceed as well on account of glueing together of the lids by the accumulated secretion. Welfberg has doubted the necessity of epilation, but he shall always do it. Prolapse of the vitreous has not been observed by Hjort after the operation, but the author has seen two in his cases but these did well without bandage. Prolapse of the vitreous in all cases does better without a bandage than with it. He has not bandaged eyes of cataract patients after extraction from July, 1897, to June, 1898. In one case of a 17 year old boy with chronic bronchitis and heart disease there was chronic conjunctivitis with eversion of the lacrymal punctum and he is sure that this would not have healed under a bandage.

Rare Case of Absolute Color-Blindness.

4 FUKALA, VINCENZ, of Vienna (*Klin. Monatsbl. f. Aug-*

enhhkde., May, 1898.), reports the case of a man who had myopia 3.5 D in both eyes. Vision, R. = O. 1, which in weaker light arose to O.2; read Jaeger No. 3 readily. Vision L. = 0.05, read Jaeger No. 6 in dim light; he was a little light-shy and carried his head upward and pinched the lids together; he was otherwise sound, strong and well developed. He said that shortly after birth, he had brain trouble and did not see at all well until his 10th or 11th year when the vision greatly improved; his family had good eyes; there was no astigmatism; the fundus was the same in both eyes; the color and contour of the papilla and the eye ground were normal; the blood vessels were somewhat narrow and relatively few, which would account for the lowered vision. He said that since childhood he had never been able to distinguish any colors. Examination with colored papers showed that all colors seemed to be dark gray, white and black; pure black was darker to him than red or violet. There seemed to be no difference in color, to him, between a highly colored picture, a copper or steel-plate or photograph.

Euphthalmin.

WINSELMANN, of Berlin (*Klin. Monatsbl. f. Augenhkde.*, July, 1898.), claims that euphthalmin is the most satisfactory mydriatic which we have to-day. By use of one drop of 5 per cent. solution mydriasis begins in 20 minutes, it reaches its maxim in 32 minutes and entirely passes away from 3 to 3 1/2 hours; by using 10 per cent. solution, mydriasis begins in 14 minutes and reaches its maxim in 23 minutes, this absorption is hastened by addition of holocain; the effect passes away in about the same time after the 5 per cent. solution. Euphthalmin possesses the following properties: 1. Enlargement of the pupil occurs in about the same time as other mydriatics. 2. The accommodation is so little affected that its influence is of no practical moment. 3. There is no effect upon the intra-ocular tension. 4. No poisonous symptoms have been observed. 5. It does not irritate the conjunctiva or the cornea. 6. Mydriasis passes away in a short time.

Some Disturbances in the Distribution of the Oculomotor Nerve Following Measles.

DREISCH (*Munch. Med. Wochenschr.*, May, 1898.),

reports three cases of paralysis of the oculomotor nerve as a sequel to measles. The first patient was a boy, 9 1/2 years of age, who, 11 days after recovery, noticed some difficulty in reading which soon increased so that he was unable to read at all. Distant vision was perfect; near vision was made perfect by a convex lens of 3D. A diagnosis was made of paralysis of accommodation, and this soon disappeared. The second patient was a girl, 8 years of age, who noticed similar symptoms 3 weeks after an attack of measles. The third patient was a boy of 14 who commenced with vomiting, chills and then diplopia. When examined he was found to have marked ptosis, incomplete paralysis of the internal, superior and inferior recti and the inferior oblique. Recovery occurred in 3 weeks. Dreisch admits that it is impossible to say how these changes occur. He does not believe, however, that they are due to the late influence upon the nervous tissue of a toxin circulating in the blood, particularly because similar paralysis occurring in diphtheria are not prevented by injections of serum. He is inclined to locate the lesion in the peripheral nerves on account of its occasional exquisite localization to a single branch.

A Case of Bilateral Chancre of the Eyelids.

✓ HELBORN, J. (*Munch. Med. Wochenschr.*, May 24, 1898.) A large number of chancres of the eyelids have been reported during the last decade, but a chancre of each eyelid is exceptional, there being only 7 authentic cases of the kind. The disease was transmitted from an individual with mucous patches in the mouth.

Myopia Operations.

✓ VÖLKERS (*Physiol. Verein in Kiel*. 29 Nov. 1897. *Munch. Med. Wochenschr.*, 1898, 14), does not operate under 16D. "After atropinization the Graefe knife is passed through the anterior chamber into the lens as far as the nucleus, the lens speedily swells, passes into the anterior chamber and in the case of children is quickly and easily resorbed, in adults severe irritation often occurs but speedily passes away. The operation is dangerless when done by up-to-date methods and is very successful in the case of people who are extremely myopic."

Modern Views on Trachoma.

SCHULHOF (*Wiener Med. Presse*, 1898, Nos. 24 and 25.), gives a very complete summary of recent work on the etiology, pathology and treatment of trachoma. He quotes some striking figures as to its prevalence; in 30 Austrian counties there were, in 1895, nearly 30,000 sufferers, while in the Russian army, in 1896, the number of victims reached the almost incredible proportion of 62 per cent. The author summarizes the results of his investigations in the following conclusions:

Trachoma is an infectious disease which can be spread by contagion. Its appearance is favored to a certain extent by special conditions, such as race, locality, general nutrition and occupation. The actual natural history of the affection is not yet established; experiments and inoculations into animals have so far failed. The hypertrophy of the conjunctiva (granulation) is pathologically and histologically the principal characteristic of the morbid process. Hitherto the following have been generally accepted as the best means of treatment: Solution of silver and its substitute argentamin, touching with copper sulphate, washing out with sublimate, the galvano-cautery, and in very obstinate cases more extreme measures, such as the use of Jequirity, peritomy and the removal of the hypertrophic folds. Among the newer remedies the following deserve a trial: guaiacol-glycerin, ichthyol, sozoiodol preparations and electrolisis. But the most important measure by far is prophylaxis by means of regulation of the sanitary conditions and prevention of the spread from patient to patient.

A Death from Sepsis Following a Sty.

GUTH, H. (*Prager Med. Wochenschr.*, No. 3, 1898.) A woman was brought into the clinic with both lids greatly swollen, conjunctiva chemotic, both eyeballs protruding, high fever, Cheyene-Stokes breathing, tonic and clonic spasms. Ophthalmoscopic examination showed septic retinitis, death followed; post-mortem showed that there was suppurative meningitis which had proceeded through infection from a hordeolum; the suppuration had infiltrated the orbital tissues and penetrated through the right cavernous sinus to the meninges.

When Are Bandages, when Cold or Warm Applications, Indicated in Treatment of Eye Diseases.

HERRNHEISER, J., of Prague. (*Die Artzliche Praxis*, XI, No. 1-3, 1898.) Cold applications are indicated in the course of acute catarrhal conjunctivitis, inflammatory stage of trachoma, blennorrhea and in pain after operations on the conjunctiva and in episcleritis. In interstitial keratitis, acute iritis and irido-cyclitis either cold or warm applications may be made. In exudative iritis, it is much better to use hot applications. The pain of glaucoma and panophthalmitis is best treated by heat, warm applications are indicated in neuralgia of the trigeminus.

Intra-Ocular Bleeding During Puberty.

ABADIE, in Paris. (*Klin. Therap. Wochenschr.*, 21, 1898.) 1. Recurrent bleeding during puberty has been denominated by Panas as the analogue of epistaxis and is to be treated by good hygiene, tonics, iron, ergotin, etc.

2. Dyscrasic hemorrhage begins as fine striped hemorrhages from otherwise normal vessels, especially the veins, producing dark red plaques, and membranous threads in the vitreous. Disturbances of the vitreous without inflammatory conditions and no pain or other changes attended by detachment of the retina, may occur; the treatment consists of muriatic or sulphuric acid lemonade, chlorid of iron, ergotin and extract of cinchona; wet cups to the temples are of use. Dyscrasic hemorrhages occur during pregnancy, hemophilia, phosphaturia and asoturia, dilation of the stomach, pernicious anemia, leucemia and malaria. Where the blood in hemophilia shows no tendency to clot, chloride of lime may be given.

3. Secondary intra-ocular hemorrhage in Chorio-retinitis is to be differentiated from dyscrasic hemorrhage by the choroidal spots and changes in vessels, the treatment is directed to the control of the chorio-retinitis. A subcutaneous injection of the soluble mercurial salts, abstraction of blood from the temples, ergotin and quinin preparations are helpful remedies.

4. Apoplectiform retinal hemorrhages occur principally in the retina and choroid, the impregnation of the tissues

with blood is in the pathognomonic. It may extend to the iris and increase the intraocular pressure causing glaucomatous pains. Abadie does not treat these ruptures of the vessels from the stand point of arterial or heart disease, but considers that the cause lies in the sympathetic which controls the vaso-motor constriction and dilatation. This form of bleeding may lead to destruction of the sight and when occurring in the brain all the symptoms and complications of cerebral hemorrhage may occur; such are to be treated by quinin internally and eserine and pilocarpin locally; if glaucomatous symptoms appear wet cups may be put on the forehead; recurrent severe hemorrhages may even lead to enucleation.

The Pupil Reflex in Infectious Diseases.

CORTE (*Klin. Therap. Wochenschr.*, May, 1898.), draws the following conclusions: 1. In measles, scarlet fever and ordinary smallpox the pupil reflex is normal; in the primary form of hemorrhagic smallpox it is weaker or absent. 2. In typhoid fever complicated with lung affection the pupil reacts slowly, whereas in infectious endocarditis the pupil reflex is absent. 3. In puerperal fever complicated with endocarditis or peritonitis the pupil reflex is wanting.

The Operative Treatment of High Grades of Myopia.

DISTLER, of Stuttgart. (*Med. Korrespblt. d. Württemb. Arzt, Landesverein*, LXVII, No. 27, 1898.) The author always operates upon the worst eye but deems it necessary to operate upon both. The contrary indications are thick opacities of the vitreous and severe changes in the macular region. The operation is without danger; it does not prevent detachment of the retina or intra-ocular hemorrhage but does not predispose to the same; the result is always good; myopia does not increase and loss of accommodation is of no moment; binocular vision may be again obtained.

The Indications for Myopia Operations.

SCHREIBER, P. (*Festschr. zur Feier d. 50 Jahr. Bestehens der Med. Gesellschaft zu Magdeburg*, 1898.), gives a complete resumé of the literature and comes to the conclusion that too many myopes have been operated upon and

that in the future cases will be selected with more care and methods of operation chosen which are the least dangerous. The operation for myopia is attended with much danger from wound infection and if the operative treatment of myopia were not attended by a tendency toward detachment of the retina, the operation might be recommended. An eye which has to be opened at least three times to produce a good result is much more liable to infection than that of an ordinary senil cataract. Sattler had loss of vitreous in 25 per cent. of his cases; in 85 cases Otto had increase of ocular tension in 23; the author had operated upon 14 cases of high grades of myopia and had observed increase of intra-ocular tension in 4 cases. Otto says that without doubt the worst complication from this operation is the occurrence of detachment of the retina, this may be prevented by careful selection of cases. The lowest grade of myopia to be operated upon should be 16.0 D; should a patient have this grade of myopia and be able to work satisfactorially it is inadvisable to recommend operative treatment. The number of cases of high grade myopia 16.0 D (and over) during the 14 years is stated by the author to be 80 cases out of 5094, which is only 1 1/2 per cent; in these 80 cases there were not less than 44 cases which could not be recommended for operation, in 17 of these with proper correction of the refraction, business could be properly pursued; 27 cases were either very weak sighted in one eye or entirely blind. From the author's material during the last 14 years only 36, out of 3 a year, could be recommended for operation; he divides his operative material into two groups; young myopes, under the age of 14 with progressive myopia and those of higher age; for either group he recommends a different operation; he follows Hirschberg in recommending, in the case of children, division of the capsule and the superficial lens layers after the dilatation of the pupil; the after treatment is atropin and in two or three months the lens is entirely absorbed. He agrees with v. Hippel that the operation prevents further development of short sightedness. It is desirable that all high grade myopes should have discission done while they are young; in older cases it is necessary to extract the lens after discission.

The Ocular Changes in Disseminated Sclerosis.

LUEBBERS (*Archiv. f. Psychiat. u. Nervenkr.*, XXIX 3.), describes 11 cases of multiple sclerosis, one of which was examined post mortem. The optic nerve in this case showed complete atrophic changes with primary increase of interstitial connective tissue and in part also gray degeneration of the fibres of the optic nerve. In the cases observed clinically, in no case was there complete atrophy. Most commonly there were atrophic discoloration in the papilla and seldom optic neuritis. Three cases normal; in seven simple scotoma; in two cases peripheral contraction of the visual field and nystagmus in six cases.

ABSTRACTS FROM CURRENT AMERICAN AND
ENGLISH OPHTHALMOLOGICAL
LITERATURE.

BY CHARLES H. MAY, M. D.,

NEW YORK.

Tenectomy for Strabismus: A Simplified Operation.

SMITH, PRIESTLEY, of Birmingham, Eng. (*The Ophth. Review*, April, 1898.)

"If the shortening or advancement of an eye muscle were as simple and expeditious a proceeding as the division and setting back of its antagonist, we should, I think, employ this method more frequently than at present in the treatment of strabismus. There are many cases in which, other things being equal, one would choose to alter the position of the eye by increasing the effective power of the one muscle rather than by lessening that of the other, or at least to do both in moderation rather than the latter to a greater extent. It is not my purpose at present to discuss the proper application and combination of these two principles; I desire merely to describe a method of shortening a tendon which seems to me to be a step in the direction of greater ease and simplicity.

"The instruments required are the speculum, fine conjunctival forceps, hooks, and scissors, as for a simple tenotomy; a special tenectomy forceps with catch, like Prince's, but bent in a different direction so as to be applicable to either eye and without the prosecting points; a narrow bent keratome or 'bent broad needle;' a needle-holder, and a single black silk thread armed with three curved needles, one at the middle, one at each end. Each needle when threaded should be passed through the thickness of the thread as near as may be to the eye; this prevents its dropping off but involves no knot.

"PROCEDURE:—Along the lower border of the tendon which is to be shortened make a horizontal incision through conjunctiva and underlying connective tissue long enough

to permit the hook and forceps to pass easily beneath the tendon side by side. Introduce the hook and hold it against the insertion of the tendon. By the side of the hook, but at 1 mm. from it or a little more, pass in the hinder blade of the forceps and clamp tendon and conjunctiva together. Withdraw the hook and introduce in its place one blade of the scissors. Divide tendon and conjunctiva together, thus leaving an anterior stump, 1 or 2 mm. long, the posterior stump being held by the forceps. Make another short incision backward from the tip of the forceps parallel with the original incision. Then, holding the posterior stump a little away from the globe, pass the middle needle through the horizontal meridian of the globe, namely, in a line drawn from the middle of the pupil to a point somewhat above the level of canthus.* The needle should generally emerge about midway between the forceps and the canthus, but the exact point will vary with the amount of effect desired. Having drawn the double thread through to a sufficient length, cut off the posterior stump close, or near, to the forceps, thus removing the forceps together with the tissue clamped between the blades. Now seize the anterior stump with the ordinary forceps and tunnel through it with the keratome before trying to pass the needle. The point of the keratome should enter the back of the stump at the line of its junction with the sclera, and should pass forward so as to slightly split the sclera and appear beneath the conjunctiva 2 or 3 mm. nearer to the corneal margin. When the point is visible beneath the conjunctiva withdraw the keratome and pass one of the terminal needles along the track thus made. Tunnel again and pass the second needle in like manner and so that the two threads immerse near the corneal margin and about 5 or 6 mm. apart. Cut off the needles.

"If the antagonist is to be tenotomised, gather the four threads together, give them to the assistant, and let him draw the eye over into the necessary position. Divide the antagonists. Separate the two threads which perforate the posterior stump, and having ascertained which passes to the upper, which to the lower puncture in the anterior stump, tie each upon itself, drawing it together in the first

place merely with a double twist, and making sure that both sutures are drawn tightly and the divided tissues brought well together before tying the final knots. Cut off the threads near to the knots. Cover the eye closely with pad and strapping.

"This operation is easily performed. It shortens the tendon with a minimum disturbance of the parts concerned and produces little puckering of the conjunctiva, little subsequent swelling, and from the same reasons less pain than when a large tract of conjunctiva is included in the sutures. I have performed the operation more than twenty-five times, and except one or two of the earlier cases, and in some coming from distant places, have allowed the patient to go home at once as after a simple tenotomy. I should not consider this safe, however, unless the eye were closely covered by a pad held immovable in place by adhesive plaster. The dressing has usually been removed on the second or third day and replaced for two or three days more. In order to give the sutures a good hold anteriorly the needles must pass beneath some fibres of scleral tissues in front of the insertion of the tendon. It seems to me easier and safer to guide a perfectly pointed narrow keratome in the right direction than to force a passage with the ordinary needle."

On Continuous Sterilization For Knives and Other Cutting Instruments.

✓ J. A. LIPPINCOTT, M. D., Pittsburg, Penn. (*Archives of Ophth.*, July, 1898.) The writer gives the results of a series of experiments undertaken with a view of ascertaining the best methods of making knives, scissors, etc., surgically clean. His experiments confirmed the experiences of others that there is no complete sterilization upon immersion of knives into boiling alkaline solution for ten or twenty seconds, while prolonged immersion, for ten or twenty minutes, impairs the cutting qualities of edged instruments.

His plan was to smear infecting material upon instruments and then to dip these into culture tubes and to observe the effect upon the latter after a certain time. Before contact with the culture tube the infected instruments were exposed to various germicidal agents for different

periods of time. A table is given of the result which he summarizes follows. 1. That alcohol is ineffectual for sterilizing purposes; 2. that short exposures to formaldehyde gas whether derived from formol or from the formaline pastilles, cannot be trusted; 3. that 24-hour-exposures to formaldehyde gas derived from the pastilles while retarding do not prevent growth; 4. that 24-hour-exposures to formaldehyde gas given off from formal seem effectual; 5. that weak solutions of formol will not answer, even a ten per cent. solution failing in a certain proportion of experiments; 6. that 24-hour-exposures to the action of a twenty per cent. solution of formol containing 2 or 3 per cent. of borax may be confidently relied upon to kill germs.

The writer found that knife-blades exposed for more than 24 hours to formaldehyde gas were more or less corroded, but that a twenty per cent. solution of formol containing 2 or 3 per cent. of borax was entirely innocuous, so far as the blade was concerned. He advocated, therefore keeping the instrument in a twenty per cent. solution of formol in which 3 per cent. of borax has been dissolved and merely removing them from such a solution when used in operating. The fluid, if not unnecessarily exposed, will retain its potency for months, though assurance can be made doubly sure by adding a small quantity of formol to the solution every three months and keeping a record of such additions upon the jar.

German silver and aluminium handles are slowly acted upon by the fluid and a fine film may be deposited upon the blade; this should be wiped off with sterile cotton before operating. The entire instrument must, of course, also be rinsed in sterile water before use in operating.

The writer adds the following practical details of the method: "Immediately after each operation, the instruments which have been used are wiped with wet cotton and placed in a tray containing weak borax solution. From this tray, at the end of the operating hour, the edged instruments are transferred to steel boxes with numerous perforations at the top, bottom, and on each side. The boxes are then dropped into a wide-mouth specimen jar (a common fruit jar answers very well) containing enough of

the solution to cover them well, and here they remain until the next operating day. The jar I use is eight inches wide by nine inches deep and is kept two-thirds full. The instrument boxes rest on a glass plate, which is supported on four steel legs and which lies two or three inches below the surface of the fluid. The boxes hold as many instruments of each kind as are likely to be used on any one day, because it would be obviously illogical to use an instrument more than once without re-sterilizing. In preparing for operation, and while cocain is being applied, the boxes are lifted out of the specimen jar by means of a sterilized hook and suspended for a moment or two to let the fluid drain off. They are then placed in a small tray containing a weak sterile borax solution. From this they are transferred to a larger tray containing some of same solution, from which they are lifted, when required, by means of a hook, and placed upon an aseptic towel. Each instrument, before it is used, is wiped with a bit of cotton which has been boiled in a weak borax solution. This wiping is for the purpose of removing any film which may possibly have adhered to the blade."

✓ **The Galvanic Current For the Treatment of Pterygium.**

STARKEY, HORACE M., M. D., of Chicago, Ill. (*Journ. of Am. Med. Assoc.*, Sept. 17, 1898.) The writer describes the results obtained by the use of a galvanic current in the treatment of suitable cases of pterygium—small pterygia, not encroaching much upon the cornea and especially when there is much enlargement of the blood vessels. This treatment was employed in 19 cases. "In every instance the pterygium has been reduced in size, and in most cases the growth has been entirely checked; and while in about 50 per cent. of the cases the cure has been radical, in about 20 per cent. the growth has recommenced at a later period and some form of operation has been necessary." Recurrences took place chiefly in unsuitable cases and were not more frequent than after other operations usually employed.

The electricity acts as follows:

- "1. It coagulates the blood in the vessels, thus stopping the blood current and causing the vessels to disappear.
2. It produces a mild adhesive inflammation of the

sub-conjunctival tissues, thus forming a firm cicatrix between the conjunctiva and the sclera, so that the gliding of the former over the latter is prevented, and 3, it destroys micro-organisms in the tissues, so that, if the claims advanced by certain investigators that micro-organisms are the cause of this disease should prove to be well founded, this treatment would still be rational.

"These effects are all produced by the positive pole when used as the active agent. When the negative pole is used we get solution and absorption of the submucous hyperplasia and of the thickened conjunctiva.

"The method of employing the current is as follows: Any source of electricity may be employed, provided it produces a smooth, constant and certain current of sufficient electro-motive force to overcome the resistance of the body, and provided further that it can be so controlled as to deliver a current of from one to five milliamperes. The current should be completely under control and should be accurately measured by a reliable milliamperemeter which should measure fractions below five milliamperes. The current at the terminals should be tested before each operation. The apparatus being in good order, the eye to be operated upon should be cocaineized and a fine platinum needle, connected with the positive pole of the battery, should be introduced through the conjunctiva near the apex of the growth, and passed close to the sclera through and beneath the pterygium, and at a right angle to the direction of the growth. The circuit may now be completed by having the patient press a well-wetted sponge connected with the negative pole against the palm. The currents should be turned on till the meter shows that one, two or three milliamperes are passing.

"This current should be maintained for one or two minutes. A second puncture should be made in a line parallel with the first and two millimeters distant, and if it is thought desirable a third may be made. The immediate effect seen is the formation of gas, which appears in bubbles upon the surface at the point of entrance and exit of the needle, and which cause some puffing of the conjunctiva along the line of puncture. Considerable hyperemia of the conjunctiva is occasioned, but large vessels

with which the needle comes in contact are more or less collapsed. The pain occasioned is insignificant, and while there is some feeling of irritation and fullness in the eye for a few days, this has not been sufficient in any case to prevent the patient going about his regular duties. The treatment may be repeated in four or five days, or it may be delayed as many weeks, at the convenience of the physician and patient.

"The advantages of this method are: First, it avoids any loss of tissue; second, it is painless; third, it does not incapacitate the patient; fourth, it stops the progress of pterygia seen in the early stages. With these advantages is coupled the fact that it seems quite as free from recurrences as any other method. It is not advised except as a palliative in broad, fleshy pterygia or in those encroaching much upon the cornea."

Steel in the Vitreous, Located by Means of the X-Ray and Removed with a Magnet, with Description of an Arrangement for Determining When the Magnet Has Found the Steel.

STARR, ELMER G., Buffalo, N. Y. (*Ophthalmic Record*, July, 1898.)

The writer has given the history of a patient who was hit in the eye by a bit of steel. He was seen 48 hours after the injury, at which time the vitreous was filled with blood and no reflex could be made out. A cut appeared in the sclerotic above the cornea, and a corresponding one through the upper lid. A small opening through the sclera was found, which admitted a fine probe into the vitreous. By means of the fluoroscope and X-ray the piece of steel was seen moving freely about as the eyeball rotated.

"After an anesthetic was administered a small opening was made through the sclerotic at the side (its lowest point as the patient lay on his side), and the point of a powerful electro-magnet was presented to the lips of the cut. Connected with the magnet was a telephone, one terminal of the telephone being in connection with the point of the magnet and the other being connected with a zinc plate covered with a moist sponge, which was held in contact with the patient's body. As soon as the at-

traction of the magnet drew the piece of steel into contact with its point a distinct sound was heard in the telephone, which was held to the ear, thus showing that the steel had been found and making it unnecessary to explore further with the magnet point.

"In this instance the moment the magnet point was presented to the wound the piece of iron came to it. In another case where a bit of iron had become entangled within the eyeball in its coats, this device made it possible to know just when and where the body was found, so that it was possible to follow along the magnet tip with forceps and seize the iron. The forceps made for this purpose are of hard brass, nicked, as steel forceps would cling to the magnet and be uncontrollable."

A New Perimeter.

WILLIAMS, CHARLES H., M. D., Boston, Mass. (*Journal of the Amer. Med. Ass'n*, October 1, 1898.) "In testing the field of vision it is desirable to have the same illumination of the test object in all parts of the field, and to be able to diminish the intensity of this illumination by a known and measured amount when we wish to test the field for white or color in cases of beginning atrophy, or other conditions where there is a marked difference in the extent or shape of the field of vision when tested with a full and with a diminished amount of light. This seems to be best accomplished by making the test in a dark room, and using two incandescent electric lights of one-candle power, each for the test object and fixation point. A Förster's perimeter, with a semicircular arc of hard rubber is arranged so that one lamp is placed in the center of the arc, and about an inch from it, to be used as the point of fixation. Slides are made so that pieces of ground glass, London smoke glass, or diaphragms with openings of various sizes and shapes can be inserted in front of this lamp. The other lamp is arranged in a similar way, and can be moved back and forth from one end of the arc to the other, its motion being controlled by a small electric motor mounted on the perimeter and geared so that the test lamp is moved on the arch with the desired speed. The motion of this lamp can be reversed at any time by

reversing the polarity of the armature of the motor by means of a switch held in the examiner's hand; in this way a motion back and forth can be obtained for the test object without going near the perimeter or without taking the examiner's gaze off the patient, thus making sure that the patient does not alter the direction of his eyes during the examination.

The Eye Symptoms of Acromegaly. An Abstract of an Essay on Acromegaly, to Which Was Awarded the Boylston Prize of Harvard University for the Year 1898.

HINSDALE, GUY, A. M., M. D., Philadelphia, Pa. (*Medicine*, July, 1898.)

The appendages of the eye are liable to be involved early. The bones and orbital ridges are heavy; the cartilages and skin of the lids thicken by reason of a hypertrophy of the lowest layer of the true skin and of the connective tissue and glands of the skin. The secretion of tears is occasionally augmented. The pigment may be increased and the general color of the lids may be like bronze. The globes themselves are prominent, constituting an exophthalmus which has been so extreme as to occasion a true luxation of the eyeball. We find exophthalmus recorded in 23 out of 130 cases, or 17.5 per cent. Exophthalmus probably occurs by reason of a proliferation of the adipose tissue of the bulb.

The movements of the eyes may be slow, with a failure to raise the lids synchronously.

Nystagmus has been observed. It may be either spastic or ataxic. Internal and external strabismus have been observed.

There may be a complete oculo-motor paralysis (third nerve), and occasional partial paralysis of the sixth. Diplopia may, therefore, be observed as a result of ocular paralysis. The irides sometimes react slowly to light, but normally to accommodation. In Lynn Thomas' case the iris did not react when a jet of light was thrown into the insensitive half of the left retina, it being a case of left temporal hemianopsia. But both pupils contracted when the light was focused on the sensitive portion of the retina (Wernicke's reaction).

Vision.—This has been recorded as normal in many

cases. It is impaired in the majority of cases. In our analysis of 130 cases, we have found some note as to defect of vision in about 61 or 48 per cent. It is quite likely that the proportion of cases of defective vision is much greater than these figures would imply, inasmuch as all cases are not studied with equal care in this respect. The visual acuity may vary from normal to a slight amblyopia or even complete amaurosis, in which there may be either congestion of the optic nerves or neuro-retinitis, with complete atrophy of the nerves.

The form fields, and sometimes the color fields, are very commonly restricted. This condition may be an irregular narrowing of the visual fields, or a clear-cut temporal or, rarely, a nasal hemianopsia (case of Bard). Bitemporal hemianopsia is due to a blindness of the nasal half of each retina, causing a loss of the temporal half of each field. This symptom, as we shall see later, is caused by an overgrowth or neoplasm of the hypophysis pressing on the optic nerves and by bony changes in the optic foramina consequent on the abnormal growth of the lesser wing of the sphenoid bone. In this manner the arterial supply of the nerve and eyeball is disturbed. Complete homonymous hemianopsia has been observed by Ross, and also by Sir W. H. Broadbent, and was considered to be due to a tumor of the pituitary body pressing on the right optic tract. Left homonymous hemianopsia was observed by Dodgson, and was also recorded by Dulles, and in the latter case the examination having been made by De Schweinitz.

An example of ocular changes in acromegaly is seen in a case recorded by M. Arthur Benson. The patient, a farmer of 38, first sought medical advice for failing vision. It was found that he had a central scotoma for colors, and probably hemianopsia for color. These symptoms almost entirely subsided under the use of iodide of potassium and the cessation of tobacco. Two years later, however, when the use of tobacco was resumed, vision was totally lost; but gradually it was completely restored under the use of fresh thyroid extract, 25 minims, three times a day. There remained, however, a slight defect in the upper temporal quadrant of the field in each eye—tetranopsia. The changes in this case were, therefore, largely of a

toxic character. More typical cases of ocular disturbance are those recorded by Strzeninski.

The visual disturbances are among the early signs, and usually take a progressive course. In one of Schultze's cases the first symptoms of visual troubles had existed for ten years, and during the last half of this period there had been complete temporal hemianopsia. In Long's case blindness had existed for ten years, commencing at the age of 38. Complete blindness has occurred within two or three years from the outset of the ocular symptoms.

Bitemporal hemianopsia has been quoted by many observers; temporal hemianopsia of the right side is recorded in five instances, of the left side in five cases.

The ophthalmoscope shows, in the early stages, a venous congestion; later on, a papillitis. In a case as, for instance, that of Benson, we find the nerve paler than normal, with evidence of past perivasculitis, while in Pel's case there was choked disc of such pronounced type that the diagnosis of brain tumor was made from the ocular examination. The condition is, however, a rare one, and its rarity is explained by Pask as due to a very marked agglutination of the optic nerve fibers under the pressure of the pituitary body, cutting off the communication of the intervaginal space of the nerve with the subarachnoid space of the brain, this communication being supposed necessary to produce choked disc.

Optic Atrophy.—This is, naturally, consecutive upon the pressure symptoms. Whenever, as we have learned from cases that have been examined post-mortem, the optic nerves have been flattened by contact with the ever-expanding hypophysis, the microscopic examination will show a degeneration of the nerve fibers. The clinical symptom will therefore be, on ophthalmoscopic examination, a progressive atrophy of the optic nerve. An observation recently made by Strzemieski (1897), shows us that in the cases of atrophy that are not preceded by temporal hemianopsia we must suppose that the gland is considerably hypertrophied, and exerts from the start a pressure upon the nerves *in toto*. How far the changes in the optic nerve are due to bony changes in the base of the skull has given rise to some discussion. It is probable, as

Broca believes, that there may be some narrowing of the optic foramina from this cause; but evidence on this point is not at hand.

Pains in the eyeball of a neuralgic type are recorded by a number of observers.

Malarial Affections of the Eye.

YARR, MAJOR T. M., R. A. M. C., F. R. C. S. I., London, Eng. (*British Med. Jour.*, Sept. 2, 1898.)

"Textbooks on diseases of the eye, as a rule, dismiss the subject of malarial eye affections in a few words; in fact, I am only aware of one in which anything like an adequate summary of the state of present knowledge of this important class of diseases is given. When we consider the large amount of space often devoted in these works to diseases and congenital defects of excessive rarity—to the curiosities of ophthalmology, so to speak—the absence of detailed reference to malaria becomes astounding.

Most medical men in practice in the tropics are familiar with a distinctively malarial class of eye diseases, with characteristic symptoms, characteristic ophthalmoscopic signs, and above all, characteristic pathology; and few writers on tropical diseases omit more or less detailed allusions to the subject.

Malarial eye lesions all originate in circulatory troubles, and may be conveniently classified under the following heads: 1, Neuritis; 2, retinal hemorrhages; 3, retino-choroiditis; 4, effusions into the vitreous.

I. Malarial Neuritis.—From one of my Hong Kong case books I take the following brief notes of a typical case of malarial neuritis:

Private A. F., admitted to hospital complaining of supra-orbital pains, dimness of vision, and photophobia. During preceding twelve months he had been in hospital seven times with malarial fever; no attack of exceptional severity; he is thin, anemic, spleen slightly enlarged; temperature normal, urine normal. Vision 6/60 each eye; fields normal, color perception unimpaired; disc raised, reddish-gray, margins blurred; rest of visible fundus normal, save for a slight haze. He was placed on light,

nutritious diet—chicken, fish, beef tea—and given quinine. A week later the visual acuity had improved to 6/18, but reverted after three days to 6/36, and varied between that and 6/24 for some time. Five weeks after admission it suddenly became 6/12, at which it remained. The supra-orbital pain and photophobia ceased a fortnight after admission. After seven weeks in hospital he was sent to the sanitarium on the "Peak," and from thence invalided to England a month later with "malarial cachexia." Examined again before leaving: V. A. 6/12, fields normal, with the exception of a very slight contraction on the nasal side; color perception normal; fundus normal, with the exception of a slight grayness of the temporal half of optic disc. Signs and symptoms binocular throughout. No history of syphilis.

I have selected the above case as embodying most of the characteristics of the disease: (1) It will be seen that the patient suffered from repeated attacks of malarial fever. (2) In the commencement supraorbital pain and photophobia are almost constantly present; night blindness frequently. (3) Color perception remains unimpaired, except in the rare case ending in complete atrophy. (4) The variations in the visual acuity in the course of the malady form the most characteristic symptom and distinguish malarial neuritis from all other forms. A diminution of the V. A. to $\frac{1}{10}$ th can rise in two or three weeks to $\frac{1}{2}$ or $\frac{1}{3}$, falling again, perhaps in two or three days. (5) Fields intact, or only slightly contracted. (6) The fundus changes visible with the ophthalmoscope include swelling of the papilla, which assumes a grayish-red color, edema of the circumpapillary retina, with effacement of the papillary margins and enlarged and tortuous veins. The peculiar coloration of the papilla—*teinte-rouge-grisatre*—due to parasites in its capillaries is pathognomonic. In about a third of the cases tiny peripheral hemorrhages are also found. (7) About 80 per cent. of cases terminate in a partial atrophy, indicated by varying diminution of visual acuity, irregular contraction of the field, and slight grayness of the disc; many end in apparently complete recovery; some rare cases go on to complete atrophy.

Pathology and Morbid Anatomy.—For our knowledge of

this branch of the subject we are mainly, if not entirely, indebted to Poncet, who shows conclusively that the changes in the disc and retina in this disease are due primarily to melanæmia with increased vascularization, the subsequent atrophy or partial atrophy being explained by consecutive endarteritis of the vessels. The affection is always binocular, although it does not usually begin in both eyes at the same time.

II. Retinal Hemorrhages.—Two varieties of retinal apoplexy are found in association with malaria.

1. Minute Peripheral.—Minute hemorrhages in the ciliary zone of the retina are frequent in acute attacks of fever; they are often so very minute and so far forward as to be easily overlooked. Poncet found them in all cases of death from malaria. They may accompany or follow neuritis, but often form the only apparent lesion of the fundus. It seems probable that many of the transient disturbances of vision so commonly seen in malarial fevers are due to slight edema of the retina, followed by these tiny hemorrhages.

2. Large Peri-Papillary and Macular.—The large peripapillary and macular hemorrhages are much less frequent, and, like the neuritis which they sometimes accompany, are usually seen only in malarial cachectics. These are of much graver import, always causing some impairment of vision, and occasionally even absolute loss. I believe many of the cases of "sudden and persistent amaurosis" described by writers on malaria to be due to macular hemorrhages. In a case of malarial cachexia invalided from the Indian frontier, which I recently saw at Netley by the courtesy of the director-general army medical staff, there were several hemorrhages arrayed in a curiously symmetrical manner along the inferior temporal vessels in both eyes. V. A. in right = 6/12, in L. = 6/24; urine normal. Microscopic examination shows these retinal apoplexies in malaria to be due to impacts of parasites, followed by extravasations.

III. Retino-Choroiditis.—In about 20 per cent. of acute intermittents, generally toward the end of the hot stage, patients complain of supraorbital pains, tenderness on pressing the eyeball, photopsies and photophobia. Ex-

amination then discloses a general hyperemia of the fundus, mainly venous; red, slightly swollen papilla, surrounded by a gray veil, and general haziness of the retina, which appears to have an undulating surface—"dunes" with intervening depressions. This œdematous state of the ocular membranes—the first stages of malarial retino-choroiditis—generally subsides without leaving any appreciable trace. I have been able to watch the progress of such a case in a man—a discharged soldier, who had suffered much from malaria in Burmah—who has been attending Moorfields for the last twelve months; the fundus is now of an almost uniformly gray color, as though powdered with pepper, the disc pale, and the arteries reduced to fine threads; the distribution of the choroidal vessels seem almost white, with a central red streak; pigment layer of retina and chorio-capillaris atrophied; vision 4/60 in one eye, 6/60 in the other; some myopic astigmatism, but the correcting glasses only improve to 6/36 and 6/12; fields irregularly contracted. When first seen he had only general haziness, and loss of luster of retina, with V. 6/12 in each eye, with correction. The subsequent capillary atrophy of the choroid, and partial atrophy of the optic nerve is due to chronic inflammation of the choroidal and retinal vessels, set up by the irritation of the plasmodia, ending in atrophic changes.

IV. Effusions Into Vitreous:—

White Infiltration of Vitreous.—This rare and curious affection was first described by Seely, and consists in an infiltration of the vitreous, forming stages, causing almost complete loss of vision for a time, and giving a characteristic white reflex with reflected light. Seely attributes it to a serous infiltration, due to chronic paludism. In his two cases the progress of the disease was oscillating for several months; eventually the visual acuity became normal under prolonged quinine; in one case mobile opacities persisted.

Obscure Affections.—It remains only to enumerate some of the rare or obscure affections mentioned by writers on malaria:

Sudden and persistent amaurosis without visible fundus change.—Well-authenticated instances of this are on rec-

ord. They can only be attributed to some obscure focal brain lesion.

Periodic amaurosis.—See remarks on edema of retina and retinal hemorrhages. Possibly due to quinine.

Sudden amaurosis ending in atrophy.—Possibly due to hemorrhages into the sheath of the optic nerve, occasionally cases of quinine amaurosis.

Persistent central scotoma.—I have never seen a case that was not due to macular hemorrhage.

Periodical blue vision.—Baas describes a case of malarial fever in which this curious symptom was present. I am unable even to conjecture an explanation.

The treatment of malarial eye troubles is the treatment of malaria; most essential of all is the early removal of such cases to a non-malarious country. A prolonged course of iodide of potassium is generally of benefit in hastening the absorption of vitreous opacities. Heurteloup's artificial leech to the temples, protection from light, blisters, are useful in relieving local symptoms.

Quinine amaurosis.—Light degrees of quinine amaurosis are amongst the familiar experience of all practitioners in malarious countries. A certain amount of amblyopia is almost invariably present in cases of cinchonism synchronous with the aural symptoms, and due to spasmodic contraction of the arteries. In very susceptible individuals this may amount to absolute blindness, persisting for hours and even days. In severe cases varying amounts of concentric contraction of the field remain, central vision, color and light senses being as a rule unaffected. In slight degrees of quinine amaurosis the ophthalmoscopic appearance are normal; in severe cases, with persistently-contracted fields, pallor of the disc and thready vessels are found.

Treatment.—The stoppage of quinine with tonics and nitro-glycerine generally leads to ultimate cure. I need hardly add that in treating ocular affections in malarials the possibility of the symptoms being produced by quinine should never be overlooked."

The Pathology of Neuropathic Keratitis.

FLEMING, PERCY, F. R. C. S. E., London. (*The Lancet*, July 2, 1898.) The writer has endeavored to throw some

light upon the pathology of neuropathic keratitis, as explained in the following introduction:

"The occurrence of corneal lesions in association with affections of the trigeminal nerve is well known, but much difference of opinion exists regarding the exact nature of the relationship between the two lesions. The various hypothesis suggested fall into two main groups. In the one the keratitis is regarded as a direct example of perverted trophic action of the nervous system, whereas, in the other such a supposed action of the nervous system is regarded as needless, and the various effects are thought to be mainly due to the anesthesia. This insensitive condition of the cornea may act in various ways. Thus, foreign bodies may lodge on the cornea, and, not being felt, may remain and cause irritation and ulceration. The stimulus to the reflex action of the orbicularis (blinking) being wanting the cornea will not be properly moistened, and this condition may also in part be due to arrest of activity of the lacrymal gland. Again, owing to the sensory paralysis slight injuries (with perhaps microbic invasion from the lacrymal sac or conjunctiva) may give rise to excessive vaso-motor reaction and in this way become more extensive and the reparative processes fail to take place. During the last year several cases of "neuropathic keratitis" have been under my care at University College Hospital, and as each has some points of special interest I propose to briefly record them and at the same time to review previously recorded clinical cases and post-mortem examinations and also the experimental investigations, with the object of ascertaining how far such evidence favors one or other of the previously mentioned hypotheses."

He calls attention to the fact that constant exposure of the eyeball does not necessarily lead to keratitis as shown by numerous cases of old standing Bell's paralysis and many cases of Grave's disease. And when ptosis is associated with the fifth nerve lesion, this protection does not prevent—though it may modify—the occurrence of typical neuropathetic keratitis.

In another group of cases, the cornea may be completely anesthetic for a long time and yet no keratitis be set up;

an example of this sort occurring in a man suffering from facial herpes is cited and numerous other instances reported by various observers are alluded to. Further, complete removal of the Gasserian ganglion in man, with consequent anesthesia of the cornea, is not necessarily followed by keratitis.

The writer then describes another group of cases in which typical neuropathetic keratitis exists with a normally sensitive cornea and mentions the history of such an example. And, lastly, in reference to the hypothesis that an insensitive cornea is less resistant to traumatism, it must be noted that operations on insensitive cornea may do quite well.

"It seems fair to conclude from the consideration of these and similar cases that mere anesthesia of the cornea with consequent dryness and impaired vaso-motor reaction cannot be regarded as the essential factor in the production of the keratitis, though there can be no doubt that anesthesia and want of protection do modify the course of the inflammation. And this conclusion is further strengthened by the fact (to be more fully emphasized later) that the keratitis is frequently preceded by iritis."

Mr. Fleming next considers the evidence respecting the hypothesis that the keratitis is the direct outcome of some perverted trophic nervous action. He refers to the existence of such action in other parts of the body as instanced by acute bedsores in some spinal diseases, etc. Examples are given showing that the retention of normal sensation in a part may be accompanied by perverted trophic action, thus in facial hemiatrophia neuropathic keratitis and affections of the deeper structures of the eye have been observed. Trophic lesions have also been recorded as associated with severe cases of trigeminal neuralgia. "Thus though it may be impossible to prove clinically that neuropathic keratitis is due to the trophic lesion, yet such an explanation seems most probable."

"The further question then arises, viz., whether such trophic action is to be viewed as one of paralysis or as one of irritation. The clinical evidence points most strongly to the process being one of irritation. In the first place, cases of herpes are associated

with neuralgic pain; in the next, a history of preceding neuralgia is very commonly to be obtained in cases of trophic keratitis, even though the cornea be anesthetic at the time when the keratitis supervenes; thirdly, aseptic removal of the Gasserian ganglion, with healing by first intention, is not necessarily followed by keratitis, even though the eye be not protected; and finally (and perhaps most important) cases are frequently met with in which a condition of iritis may precede the keratitis." A number of cases are recorded which bear on these points.

The writer next reviews the experimental work done to elucidate the nature of the action of the fifth nerve on the nutrition of the cornea and then speaks of the lesion of the fifth nerve found associated with trophic keratitis. "From the point of view of the lesion being of the nature of irritation, it is important to note that the nerve is, as a rule, only partially damaged." The paper ends with the following *conclusions*:

"From the above considerations, it seems fair to conclude that the nutrition of the eyeball is directly dependent on the integrity and condition of certain nerve-fibres contained in the Gasserian ganglion and ophthalmic nerve, and that irritation of these fibres leads to those changes in nutrition of the cornea which are recognized as neuro-pathic keratitis. As to the exact *modus operandi* of such irritation little can be said. The best known effect of nervous stimuli on the structure of the organs is that produced by stimulating the secreting nerve of glands. Now, the nutrition of the eyeball is dependent largely on the fluids derived from the ciliary body and within the last few years structures resembling glands have been described in the ciliary processes and those glands have been found enlarged and showing increase in their epithelium in cases of 'serious iritis,' a condition characterized by increase of aqueous humor and alteration in its composition, as evidenced by the presence of keratitis punctata. It seems possible that the trophic nerves of the eyeball may be the nerves which supply these glands and that abnormal stimulation of them may lead both to an increase in the fluid secreted and an alteration in its composition. In

support of this suggestion I would recall the fact previously cited, that frequently in experimental investigations hypopyon precedes the occurrence of keratitis, and a similar sequence may be observed clinically; and also that stimulation of the fifth nerve, as in some cases of trigeminal neuralgia, leads to the increase of tension and a deepening of the anterior chamber. Further, the facts alluded to in discussing facial hemiatrophy tend in the same direction, But at the same time it must be allowed that the connection between the nerves and the integrity of the cornea may be more direct and intimate than this, and although such connection has not been definitely proved, yet the occurrence of discrete herpetic vesicles on the cornea and the degeneration of the corpuscles after section of the nerve make such a supposition quite possible."

Protargol as a Substitute For Nitrate of Silver in Ophthalmia Neonatorum and Other Conjunctival Diseases.

CHENEY, M. D., FREDERICK, E., Boston, Mass. (*Boston Med. and Surg. Journal*, August 25, 1898.) "Since Professor Neiser's first paper concerning protargol, published in the *Berlin Dermatologische Centralblatt* for October, 1897, the new silver salt has been tried by other gentlemen in urethral gonorrhea and, so far as I have learned, with satisfactory results. In diseases of the conjunctiva it has been used by Dr. Alt, and by Darier, who have reported upon it very favorably, and probably by many others.

Protargol is a chemical combination of silver with a protein substance and is in the form of a fine yellowish powder. It contains 8.3 per cent. of silver (the nitrate of silver contains 6.35 per cent.) and is freely soluble in water. It produces almost no irritation and is not precipitated by albumen or salt solutions. The fact that it does not stain the skin is something decidedly in its favor, and I have seen no discoloration of the conjunctiva from its prolonged use.

During my recent four months' service at the Massachusetts Charitable Eye and Ear Infirmary I have used protargol in one hundred and thirty cases and it seems to me to possess all the advantages of nitrate of silver, and

none of its disadvantages. The very slight degree of irritation which it causes, and in a large proportion of cases the almost complete absence of pain are its chief points of recommendation. A ten per cent. solution causes rather less flushing of the eye and discomfort to the patient than a one per cent. solution of nitrate of silver. A two or four per cent. solution can be used without cocain and the irritation is not, as a rule, more than would be induced by a one-half grain to the ounce solution of zinc sulphate.

There have been an unusually large number of ophthalmia neonatorum cases this summer and I have used this remedy in twenty-five cases. In ten of these I have used protargol in the right eye and nitrate of silver in the left in order that the results might be more accurately compared. A two or four per cent. solution was used, more often the latter, and a one or two per cent. solution of nitrate of silver. The silver was applied to the conjunctiva in the usual way with a camel's hair brush; the protargol in some cases with the brush and in some cases with absorbent cotton, while in a few cases a quarter dropper full of the solution was emptied over the conjunctiva. When applied with absorbent cotton, the cotton was used on the end of a probe and the protargol was sopped onto the conjunctiva, not brushed roughly over it. The lesser degree of irritation in the protargol eye was very noticeable. There was not the profuse lachrymation and the eye would often be open in a minute or two after the application, while the nitrate of silver eye would be tightly closed. It was also observed that there was less tendency to the formation of a fibrinous coagulate, the grayish sheds of tissue and "false membranes" in the protargol eyes. In regard to the rapidity of the decrease and duration of the discharge, there is such a variation in different cases and often in the eyes of the individual case, that it is impossible to judge with any degree of certainty. I should say, however, that in this respect the two remedies rank about equal.

As a prophylactic, Dr. Willaim L. Richardson, who has used protargol at the Lying-in-Hospital, very kindly writes me as follows:

"Protargol (two per cent.) has been used in every baby's

eyes at birth for about three months. None of the redness and swelling of the lids and none of the temporary secretion that immediately follows the use of nitrate of silver (one per. cent.) have been observed. In the few cases of purulent ophthalmia that have been treated with protargol the length of the course of the disease has apparently only been slightly shortened, but the severity of the attack has been decidedly lessened. Whether this has been due to the protargol or not, we have been, during the three months it has been used, more successful in confining the infection to one eye."

The fact that nitrate of silver does cause more or less irritation, I think, prevented its very general use as a prophylactic outside of lying-in hospitals. If protargol is as valuable, and it in all probability is, the objection is overcome and it is to be hoped that it will be generally adopted in routine practice.

I have had but two cases of gonorrheal ophthalmia in the adult this summer and protargol was used in both. In the first the cornea was extensively infiltrated when the patient came in and, as was to be expected, it perforated two days later. The second case was of less severity and made a rapid and satisfactory recovery.

In acute catarrhal conjunctivitis protargol was used in fifty-three cases. Most of them recovered promptly, but perhaps not more rapidly than they have under some of the other commonly used remedies. In a few cases recovery was slow and they seemed to do better under a collyrium of zinc sulphate and boric acid. It was generally prescribed in a one-half per cent. solution, dropped into the eyes every three or four hours. In twenty-nine cases of chronic conjunctivitis it acted very favorably in some, in others it seemed to have no especial action one way or the other, and in one case it proved a decided irritant. In twelve cases of chronic granular conjunctivitis a four per cent. solution has been used, and in three or four cases a ten per cent. solution. It seemed as satisfactory in its results as silver nitrate and was certainly much more agreeable to the patient. It was tried in ten cases of lachrymal obstruction with purulent secretion. In two or three cases where it was prescribed as a

one-half per cent collyrium, the discharge ceased entirely within a few days. In other cases where the discharge was profuse it was injected into the sac in a four or ten per cent. solution. The discharge usually lessened, but perhaps not more rapidly than it would have done under various other remedies."

The Employment of Solutions of Toluidin-Blue as Collyria, and as a Stain for Corneal Abrasions and Ulcers.

VEASEY, CLARENCE A., A. M., M. D., Philadelphia, Pa. (*The Phila. Med. Journal*, August. 13, 1898.) This compound is a member of the aniline group closely related to methylene blue; it appears as a bluish crystalline powder, readily soluble in water or alcohol forming a dark-blue solution. Dr. Veasey has been using the solution in strengths varying from 1: 50 to 1: 10,000 as a collyrium in most of the inflammatory cases which he has encountered in dispensary service during the past six months and has been favorably impressed with its action.

No irritation or stinging was observed when the stronger solutions were used but a solution 1: 1000 seemed to be just as efficient as a stronger one and did not stain the surrounding skin so deeply. He has been in the habit of flushing the conjunctival sac with boric acid solution so as to get rid of accumulated secretion and then to use the solution of toluidin-blue as frequently as other collyria would be employed under similar circumstances.

The stain has seemed to hasten materially the healing of sluggish corneal ulcers and to cause marked diminution of the discharge in conjunctivitis, especially in the acute contagious and pneumococcus varieties in which the discharge is usually so abundant. It has also been employed with benefit in purulent dacryocystitis, the formation of pus soon ceasing under its use, provided there be no necrosed bone present. The discoloration upon the surrounding skin and upon the fingers is readily wiped away with a moist pledget of absorbent cotton."

The stain has a similar action upon corneal abrasions to that of fluorescein. Corneal abrasions and ulcers are at once stained a dark blue, without any discoloration of the remainder of the cornea; and the reparative process is hastened by its use.

Conclusions from Clinical and Bacteriological Experiments with Holocain.

RANDOLPH, ROBERT E., M. D., Baltimore, Md. (*Journal of the Amer. Med. Ass'n*, Sept. 34, 1898.) The writer found that the average time employed to produce anesthesia in cases of foreign bodies was a little less than two minutes. He experimented for the purpose of testing its germicidal properties: 1. To determine the effect of a 1 per cent. solution upon the micrococcus epidermis albus, and 2, to determine whether a 1 per cent. solution of holocain has an inhibitory effect upon these same organisms. His conclusions are:

"Holocain, insofar as its anæsthetic properties are concerned, seemed in these fifty cases to have been sufficiently effective. In those cases where a test was made of the rapidity of its action, as, for instance, foreign bodies in the cornea, in pterygia, and after the application of irritating substances, the quickness with which anesthesia was produced was striking. Whether the anesthesia produced after two minutes is sufficiently profound to guarantee a painless iridectomy, or a satisfactory cataract extraction, I did not determine, but in those cases where operations of this character were performed, and where the holocain was instilled just as we do cocain, no difference was observed in the anesthesia from that produced by cocain. The drying of the cornea and dessication of its epithelium, the dilatation of its pupil, the absence of which phenomena has been noted by others has been confirmed by my own observations. The absence of these two properties should recommend it for office use for the removal of foreign bodies, as it is well known that after the employment of cocain in such cases blurred vision and slight photophobia are often present for hours.

A 1 per cent. solution of holocain has not only an inhibitory effect upon the pus organisms, but these organisms are killed when exposed to a solution of this strength for a certain length of time. No attempt was made to determine the point of time at which these organisms lose their vitality on exposure to holocain, but it may be safely said that this point is somewhere within 24 hours. Furthermore, exposure to a 1 per cent. solution of holocain

for periods of five, ten, fifteen, twenty-five and thirty-five minutes showed in every instance a gradually diminishing number of colonies in the plates, so that it is plain, in spite of the luxuriant growth around the glass rods and pieces of wood, many of the organisms were killed. It may be said, in conclusion then, that a solution of holocain of the strength employed in ophthalmic practice possesses distinct germicidal properties, a fact which it is evident enhances the value of this product."

The Use of Holocain in Ophthalmic Practice.

HINSELWOOD, JAMES, M. A., M. D., F. F. P. S. G., Glasgow. (*British Med. Jour.*, Sept. 3, 1898.)

The writer made a large number of observations on the effects of the instillation of a few drops of a 1 per cent. solution of holocain into the normal eye. The following is a brief summary of the facts observed:

1. There is complete anesthesia of cornea and conjunctiva produced in from fifteen to thirty seconds after instillation.
2. The anesthesia produced lasts about ten minutes.
3. There is immediately after instillation a slight feeling of burning, which rapidly passes off.
4. There is produced shortly after instillation a slight hyperemia of the bulbar and palpebral conjunctiva, which rapidly passes away.
5. There is no alteration in the size of the pupil.
6. There is no disturbance of accommodation.
7. There is no alteration in the tension of the eye.
8. The corneal epithelium is not changed in the slightest, but retains its normal appearance.

In short, to put it concisely, holocain seems to have no other effect upon the eye than rendering it anesthetic. Herein lies its advantage over cocain, which causes a conjunctival anæmia by constriction of the vessels, dilates the pupils, and often causes a desiccation of the corneal epithelium. Another great advantage of holocain, as evidenced by these observations, is the great rapidity of its action, producing complete anesthesia in from 15 to 30 seconds.

Used in inflamed eyes, the writer found holocain particularly useful in hospital practice, where its rapidity of

action leads to a very considerable saving of time. For examining inflamed eyes with photophobia and blephar-spasm, a few drops of the 1 per cent. holocain solution will enable one within a very few seconds to get a good view of the cornea. Used for little manipulations, such as the application of nitrate of silver or sulphate of copper to diseased lids, one is able to make applications with but little discomfort to the patient within a few seconds of the instillation of the drops. It has been claimed for holocain by some observers that where the conjunctiva is inflamed and the vessels enlarged, its anesthetic effect is more profound than that of cocain; the writer's experience did not harmonize with such observations. He thought the anesthetic effect of cocain and holocain about equal, but found the latter much quicker in action.

He gives his results of the use of holocain in 154 cases of operations upon the eye:

In the removal of foreign bodies from the cornea, holocain is an excellent anesthetic, enabling one to remove the foreign body within 15 to 20 seconds. Only three or four drops of the solution are necessary for complete anesthesia. In all the conjunctival operations the holocain proved an efficient anesthetic. The anesthesia, sufficient after 20 to 30 seconds to begin the operation, seemed to last longer than that of cocain, so that the instillation was repeated only at rare intervals, and very little of the solution was used. In none of these operations was holocain injected under the conjunctiva, but after cutting through it a few drops were let fall directly on the conjunctival opening.

In the operations in which the globe was opened, the holocain acted well. In the iridectomies it had the very great advantage of not altering the size of the pupil, and this will be of very special value in operations on cases of glaucoma. In the extractions and needling operations the only special advantage of the holocain was that it enabled him to operate sooner than would have been possible with cocain. No toxic or any disagreeable effects whatever have been observed in any of these cases. Heinz has found by experiments on animals that holocain is a poison, producing convulsions, and analagous to strychnine. He found its toxic action more intense than

that of cocain or eucain on hypodermic injection of the drug. The writer has, therefore, refrained from using it hypodermically until possessing more definite knowledge as to the doses which can be employed with safety. No toxic effects were noticed by any observers from the use of the 1 per cent. solution. The reason of this is, doubtless, because such a very small quantity of the drug is required to produce a complete anesthesia of cornea and conjunctiva, and herein lies one of its advantages.

Holocain is preferred by the writer as a most valuable agent for the production of anesthesia of the eye. Its peculiar value lies in the fact that apart from the anesthesia, it seems to have no further effect on the eye whatever. It seems to act simply by paralysis of the sensory nerve endings, and has no other action on the eye, leaving the pupil, accommodation and tension quite unaffected. The rapid action of the drug is also a decided advantage, and in dispensary practice, where one is dealing with a large number of patients, leads to a considerable saving of time. According to Heinz a 1 per cent. solution of holocain is powerfully antiseptic, as proved by experiments on the growth of bacteria, and, therefore, it is not necessary to boil the solution in order to sterilize it, which is a further advantage.

Notwithstanding this assertion of the writer, he adds that it is difficult to get even a 1 per cent. clear solution, that it must be made up with fresh distilled water, and that such a solution will not keep longer than a fortnight.

Crystals of Cocain in Preference to Solution.

BRONNER, ADOLPH, M. D., Bradford, Eng. (*British Med. Jour.*, Aug. 20, 1898.) "Cocain is largely used as a local anesthetic, especially in the ophthalmic branch of surgery. In most operations on the eyeball we use $2\frac{1}{2}$ per cent. solution applied several times. In strabismus operations a 2 to 10 per cent. solution is often injected under the conjunctiva. Toxic effects are apt to follow, and the distension alters parts and renders operation more difficult. For most operations on the conjunctiva I use cocain crystals in preference to the solution. For deep operations, such as iridectomy in glaucoma and extraction of cataracts, the crystals are

much more efficacious than the solution. The pain is less, and there is less tendency to spasm of the ocular muscles and consequent loss of vitreous and prolapse of iris. About $\frac{1}{4}$ gr. of the hydrochloride of cocain is applied to the corneo-scleral junction where the incision is to be made. The eyelids are kept open for a few seconds, then closed four or five minutes. I also use the crystals in ulcer of the cornea, and when using the galvano-cautery. In tenotomies or advancements the operation is rendered painless by the use of cocain crystals. I have also used them in several case of enucleation. As the crystals cause a severe burning pain, it is first necessary to apply a weak solution. I have never seen any toxic effects. Some allege that a $2\frac{1}{2}$ per cent. solution induces complete anesthesia, and that no better results can be obtained by a stronger solution or by crystals. This has not been my experience, and I have brought the subject forward in the hope of obtaining the opinion of others who have tried the different strengths of cocain solutions and the crystals."

ABSTRACTS FROM RECENT SPANISH OPHTHALMIC LITERATURE.

BY A. B. HALE, M. D.,

CHICAGO.

Delay in the Post Operative Formation of the Anterior Chamber.

✓ TRONCAVO, URIBE (*Anales de Optalmologia*, Vol. I, No. 1, July, 1898,) discusses the causes of the *delay in the post-operative formation of the anterior chamber*. In two cases he noticed an absence of anterior chamber long after the corneal wound had healed; such an unusual occurrence attracted his attention, and on searching the literature he was surprised to find no uniformity of opinion on the matter. The second case was extremely instructive. A laborer of 41 years, with mature cataract in each eye, was operated on both eyes at the same time, each by a different surgeon. The left eye released the cortical masses with the greatest ease; in the right eye, on the contrary, considerable expression was necessary before the pupil was clear. On the third day both corneal wounds had healed, but while the left anterior chamber was normal the right was lacking, the iris lying against the cornea, and the tension much reduced. Dilatation of pupil was produced by atropin, and still no anterior chamber. Not till the fifth day was there any aqueous.

Absence of anterior chamber is explainable in two ways: incomplete closure of corneal scar and consequent escape of fluid, or, with perfect cicatrization, a non-appearance of secretion. The theories to explain the latter condition are: Anterior synechiæ that retard the action of the ciliary glands; or synechiæ that prevent the passage from posterior to anterior chamber; or some shock that temporarily stops secretion. The first two theories, however, do not explain. The author thinks that the only explanation is absence of secretion, due not to nervous but to mechanical causes, such as the pressure of vitreous from

behind and slight adhesions to corneal surface in front, which prevent the natural secretion from the ciliary glands.

Cataract Operations.

FERNANDEZ, SANTOS, (*Anales de Optalmologia*, Vol. I, No. 1, July, 1898,) reports several more cases of cataract operations on leprous patients, with the best results, and he concludes that practically leprosy offers no contraindication to operations on the eyeball.

Expulsive Hemorrhage After Cataract Operation.

LOPEZ, FERNANDO, (*Anales de Optalmologie*, Vol. I, No. 2. August, 1898,) reports a case of expulsive hemorrhage after cataract operation in a woman of 65, myopic, but never having worn glasses. The patient had slightly atheromatous arteries, but no circulatory or digestive disturbances. The operation itself went very smoothly, no iridectomy being performed. After three days of normal progress the wound was seen to be bloody, and the lids, when opened, allowed a large clot of blood to escape from them. On examination, Lopez was convinced that there had been a rupture of an artery within the globe, and an examination of the enucleated eye eight days later confirmed the diagnosis, the sclera being very thin, and the hemorrhage having taken place from that tissue, probably near the insertions of the recti muscles.

ABSTRACTS FROM RECENT FRENCH OPHTHALMIC LITERATURE.

BY CHARLES A. OLIVER, A. M., M. D.,

PHILADELPHIA, PENN., U. S. A.

ASSISTED BY HENRY A. ROTHROCK, M. D., OF WEST CHESTER,
PENN., U. S. A.

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QUARTER ENDING SEPTEMBER 30, 1898.

Pathogeny and Treatment of Functional or Concomitant Strabismus.

PANAS, Paris. (*Archives d'Ophthalmologie*, July, 1898.) This author regards all or nearly all of the cases of the above condition as being of peripheral origin, and due to the high refractive errors and low visual acuity. His method of treatment varies but slightly from the accepted mode in this country of correcting the error, followed by tenotomy and prism exercise. The principal difference in the radical procedure is that he stretches the muscle before cutting it. His method of operation is to sterilize the conjunctiva, make a small incision, pass the strabismus hook beneath the muscle in question, rotate the eye until the corresponding side of the cornea reaches the canthus, and then cut. As a rule, he operates on both eyes. The exercises are not commenced until some time has elapsed, the refractive error having been immediately corrected.

Researches Into the Renal Permeability in the Case of Those Suffering From Senile Cataract.

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FRENKEL, HENRI, Lyons. (*Archives d'Ophthalmologie*, July, 1898.) The experiments related in this article were made upon thirty-two cataract patients with control experiments on three subjects with iridochorioiditis, and three who were selected upon account of their ages. The method selected was that of Achard and Castaigne which consisted in intra-muscular injections of half gramme doses of a five per cent. strength solution of methylene blue, the

bladder having been emptied immediately before the injection and at regular intervals afterward. The time of the first elimination of the chromogene, the first elimination of the blue green color, the period of maximum elimination, and the duration of elimination of both the chromogene (as well as the color) were all considered to be the crucial points. The observations noted and the conclusions arrived at, are as follows:

I. The thirty-two cases showed a retardation of the commencement of the eliminative process in eighteen instances and of the termination of the process in twenty-four cases.

II. Of those cases showing a normal elimination a few were unexplainable. Two were due to diabetes, while some were dependent upon iridochorioiditis or other cause, such as great heat, acting directly upon the eye.

III. In the case of patients suffering from irido-chorioiditis complicated by cataract, the control tests showed a normal or a slightly increased renal permeability.

IV. Comparative examination of the renal permeability in the case of the aged patients who were free from cataract, revealed a diminution in this respect which was nevertheless less marked than in the cataractous subjects of the same age.

V. Probably one of the reasons of this diminution in senile cataract is the sclerotic change which accompanies old age, this, as indicated by experiments, being probably greater in the cataractous subjects than in the noncataractous ones.

VI. Variations in the curve of the elimination are due to the reaction of the urine and not to disease of the liver.

VII. The test by the blue is indicative only of the tubular secretion and is not expressive of the state of the glomerulæ. It is influenced moreover by the condition of the other organs.

VIII. No increased diuresis was noticed.

Malignant Hemorrhagic Glaucoma Checked by Ablation of the Superior Cervical Ganglion.

ABADIE, CHARLES, Paris. (*Archives d'Ophthalmologie*, July, 1898.) The patient under consideration had already undergone an iridectomy followed by an enucleation of

the right eye for the above named disease when he consulted the author in regard to the condition in the left eye. The tension of the affected organ was increased, the iris was injected and contained hemorrhages. The media were cloudy. The eye itself was very painful. Eserine and pilocarpine were instilled into the conjunctival sac, and quinine was administered internally without result. Vision had fallen to the ability to perceive light in the outer field. Pain becoming intolerable, ablation of the superior cervical ganglion was decided upon. The evening following the operation, the pain disappeared and intra-ocular tension soon dropped to normal. The vitreous humor cleared and the patient gained a slight degree of qualitative perception on the temporal side. The author considers this result as another proof of the correctness of his theory that the cause of this form of glaucoma is a vasomotor dilatation.

Collyria Made with Oil.

PANAS, Paris. (*Archives d'Ophthalmologie*, June, 1898.)
 Panas recommends dissolving the alkaloids in oily instead of aqueous solutions. He states that the former are easier of introduction and do not deteriorate so rapidly. Olive oil is the one that he usually prefers. To render the oil absolutely unirritating, the fatty acids are first removed by washing with alcohol at a temperature of 90° C. This is followed by subjecting the mass to a temperature of 120° C in order to secure absolute sterilization. The temperature of the oil is then allowed to fall to 60° C. and the alkaloid is introduced. He has found that as the salts of the alkaloids are insoluble in oil it is necessary to first reduce them to a soluble base. After the drug has dissolved the material is ready for use. The method of preparation of the eserine solution differs from the others in the fact that this drug is dissolved in ether and the solution can be added to the oil. During the making of this solution, the oil is kept at a temperature of 45° C on account of the danger of explosion of the ether and in order to prevent oxidization of the eserine to rubresine. To apply these oily collyria, the author employs a small spatula of flexible glass, by means of which a drop is placed

between the edges of the lids. The solutions of atropine and eserine are made of the strength of one per cent. while that of the pilocarpine is placed at one-half per cent. and the cocaine two per cent.

Experimental Researchs on the Inoculation of Micro-Organisms in the Anterior Chamber of the Eye of the Rabbit.

PICOT, Bordeaux. (*Archives d'Ophthalmologie*, June, 1898.) After a series of thoroughly conducted experiments on the title subject of this article, Picot sums his findings as follows:

The result produced by the inoculation depends upon the quality of the micro-organism that has been injected, the typhoid bacillus vegetating in the anterior chamber apparently living without producing any notable changes; other organisms such as the tetragene and the aspergillus, producing lesions which at times are curable; others, the muguet for example, giving rise to an extensive exudate, filling the anterior chamber and occluding the pupillary area; some (the streptothrix of Eppinger among them) leading to a form of pseudotuberculosis; and lastly, some giving rise to a panophthalmitis. The largest proportion of these organisms do not remain localized but pass gradually into the circulation, the animal dying of general infection. For a time, the eye makes more or less of an effort to combat the increase of most of these forms by phagocytosis,—by surrounding the germs with a wall of lymph, and by the resistive action of the various tissues of the globe itself—notably the membrane of Descemet and the iris.

On Some Ocular Manifestations of Inflammation of the Sinuses.

DE LAPERSONNE, Lille. (*Archives d'Ophthalmologie*, June, 1898.) In a brief paper, de Lapersonne adds some symptoms and draws some addition conclusions to those that have already been cited by various writers on the subject. In regard to so-called frontal sinusitis, the most striking points were: (1) The possibility of intermittent pains simulating facial neuralgia and acting upon the ciliary nerves in a very marked manner. (2) The apparent gravity of the sub-acute accidents, producing abscess of the orbit and elimination of fairly large sequestra,

proceeding nevertheless to a relatively speedy cure without the formation of a fistule. (3) The great difficulty (on the other hand) of avoiding such fistulæ in the chronic forms of the condition that are associated with old ectasia of the sinus.

As to disturbances in the maxillary sinus, the salient point is the frequency of their action on the other cavities of the face, particularly the sphenoidal sinus and the cells of the ethmoid. The author has found that, masked as they are by the more readily recognized symptoms of the original trouble, these secondary lesions should be carefully sought for in all cases. This, he says, will explain a number of complications which are too often stated as being of reflex origin.

What is the Nature of Melanotic Cancer of the Conjunctiva?

VENNEMAN, E., Louvain, Belgium. (*Archives d'Ophtalmologie*, June, 1898.) As the result of the examination of several specimens of this form of neoplasm, the author is lead to believe that they are due to a proliferation of the cells of Langerhaus. He considers the growth to be a modified form of epithelioma; to quote his own words, "vascularized epithelioma."

Topographical Anatomy of the Macula.

ROLLET AND JACQUEAU, Lyons. These authors base their conclusions on the study of forty-five cadavers. Their method of procedure was to carefully remove the anterior half of the eyeball leaving the muscular insertions intact. All of the eyes were opened within twenty-four hours after death. As a result they find:

I. That the macula is situated from one-half to one and one-half millimeters below a line passing through the centre of the papilla; one millimeter being the medium distance.

II. After death there is nearly always to be found a retinal fold passing from the edge of the papilla to the macula. This fold, which is raised and which appears as a black point, is ordinarily merely a longer one than the rest of a series which spread out in all directions from the papilla itself.

III. The color of the macula in the cadaver is dark

brown and not yellow, the edges alone at times, having a yellowish tint.

IV. The distance from the centre of the macula to the centre of the papilla is four millimetres. In the myopic eye this distance is increased.

V. An approximative size of the macula is three millimetres in height by two in breadth.

Transitory of Intermittent Exophthalmos.

TEILLAIS, Nantes. (*Annales d'Oculistique*, June, 1898.) Teillais records a study of a case of this nature which came under his observation, leading him to the examination of the eyes of sixty-two women during the period of the menopause. From his findings, he believes: that there exists a transitory exophthalmos without a history of anterior traumatism and without any symptoms of Basedow's disease. He thinks that it is of vascular and venous origin. He finds it only in women. He says it appears to be dependent upon modifications and alterations in the uterine functions, though these may not constitute the sole causes.

A Case of Hemorrhagic Glaucoma.

GAUTHIER, (*Annales d'Oculistique*, June, 1898.) In the opinion of Gauthier, this case, which was most carefully studied, was due to a hyaline thrombosis which was situated in the foramen opticum of the chorioid and reached to the commencement of the collateral vascular branches.

Contribution to Our Knowledge of Cyanoposia.

PERGENS. (*Annales d'Oculistique*, August, 1898.) The patient reported makes the ninth on record. The attack followed the too free use of alcoholic beverages. In this case when the man awakened from a stupor of twenty-four hours' duration, brought on by the debauch, all white articles and many paler colored substances, such as the asphalt of the street, appeared blue. The right eye had lost the sensation of red, while that for yellow was transformed into the perception of a greenish tint. At the end of four days' time a normal condition of affairs, with the exception that there was a slight hyperesthesia for blue, was restored. The author attributes a central origin to his case.

Orbital and Maxillary Periostitis in the New-Born.

ROURE. (*Annales d'Oculistique*, August, 1898.) Roure has collected three cases similar to his own. In two, there was a distinct history of a wound through which the germs gained access to the tissues situated around these cavities. In the instance reported by him, there was a history of vaginitis and metritis during the last months of pregnancy. The proximity of the two facial cavities affected and the exceeding thinness of the bone separating them even in the adult, explain the cause for the spreading of the infection from one side to the other. The general infection, resulting in death, was due to a large amount of pus that had been constantly pouring into the mouth through the communications existing between the buccal cavity and the seat of the infection.

Remarks on Muscular Advancement.

LANDOLT, Paris. (*Annales d'Oculistique*, August, 1898.) Under this heading, Landolt dwells on a few of the details of the two operations of simple advancement and simple resection. Among other things he insists upon the great care that is necessary in operating upon the external rectus muscles. He says on account of the extreme friability of the muscles, one is apt to pass the strabismus hook through the tissues of the muscle instead of under it, thus failing in the object of the operation. To obviate this complication, he seizes the muscle with a special form of forceps and button-holing the muscle passes the hook through this opening. Another point upon which he lays stress is the fact that binocular vision is never fully gained until the patient has obtained the perception of the third dimension. To obtain this, he recommends the use of a stereoscope with the ordinary stereoscopic photographs as a valuable if not, the best method.

Spontaneous Hemorrhages in the Vitreous Body.

KOENIG. (*Regueil d'Ophtalmologie*, June, 1898.) Koenig furnishes two such cases that proved of exceptional interest. Both were in women. The first was remarkable on account of the fact that repeated hemorrhages left but little permanent impairment of vision.

The blood was each time rapidly absorbed. The cause in this instance was in all probability syphilis. The hemorrhages came from the chorioid and the lesions were unilateral. The other case was one that was due to an attack of ictus, and was concomitant with cerebral lesions, the patient being brought to the hospital for an apoplectic-form attack. In this case, blindness was noted as having occurred immediately on the patient's return to consciousness. The hemorrhages were found to have taken place from the retinal veins, which were sclerosed. The cerebral symptoms were produced by congestion.

Iritis Due to Ozæna.

FAGE. (*Recueil d'Ophthalmologie*, June, 1898.) The case reported by Fage was that of a young girl who was attacked with a plastic iritis. Ozæna, from which she suffered, was considered the casual factor, all other causes being cast aside by the process of differential-exclusion.

Notes on a Case of Sympathetic Retino-Chorioiditis.

COPPEZ, HENRI, Brussels. (*Revue Generale d'Ophthalmologie*, July 31, 1898.) Coppez's case makes the seventh on record. The type of the disease resembled very closely that seen in cases of specific origin. The nerve-head was "veiled," there was a mass of pigment in the retina, and the chorioid was atrophied. This condition followed a sympathetic irido-chorioiditis which came on fourteen years after an accident. The alterations in the fundus were not discovered until three years after the commencement of the disease, by which time the media were cleared sufficiently to permit an ophthalmoscopic examination.

A Case of Death Following Enucleation for Panophthalmitis.

DELBES, Périgueux. (*La Clinique Ophtalmologique*, July 25, 1898.) The patient, a blacksmith, was struck in the eye by a piece of steel which passed through the cornea, destroyed the lens, and produced a hernia of the iris. Five days after the accident, the eye was enucleated for commencing panophthalmitis. The next afternoon, fever, which at first was supposed to be due to indigestion, set in. On the fifth day after the operation the patient died. Not until twenty-four hours before death did the condition manifest itself as a meningitis.

Prognosis and Treatment of Glioma of the Retina.

PANAS AND ROCHON-DUVIGNEAUD. (*La Clinique Ophthalmologique*, July 10, 1898.) Of five cases of glioma of the retina which came under the care of these authors, three died and two were found to be living at the end of two years' time after enucleation had been performed. These results, they considered to be a fair average of mortality, despite the fact that the disease is generally considered more dangerous. They state that although there are cases on record in which at the end of even four years' time, the growth has returned, the patient may be considered out of danger as a rule at the end of two years' time. They also state that even the danger of a similar trouble appearing in the other eye is usually over by this time. The operation should be performed at the time that the diagnosis is made. If this is done before the glaucomatous period has set in, a simple enucleation with a deep section of the nerve will suffice. On the other hand, after the appearance of the glaucomatic symptoms the safest rule is to extenterate the entire orbit.

Treatment of Glaucoma by Resection of the Cervical Sympathetic.

JONNESCO, THOMAS. (*Recueil d'Ophthalmologie*, August, 1898.) Since September 1, 1897, when Jonnesco first performed this operation, he has added six cases to his list, making in all seven. One of these was a case of acute glaucoma, one of chronic irritative glaucoma, three were examples of absolute chronic irritative glaucoma, and two were of the simple chronic form. The results were an immediate and permanent fall of the intra-ocular tension, especially in four of the cases; a rapid or a marked and permanent reduction in the size of the pupil (even in those cases in which a previous iridectomy has been performed); a disappearance of the peri-orbital pain and of cephalalgia; the cessation of the attacks of the irritative glaucoma; and a marked and permanent amelioration of the sight in all of those cases in which light-perception or a slight degree of visual acuity indicated that the atrophy of the nerve had not become completed. He considers that the superior ganglion is the one to be removed. He prefers

the pre-mastoidal to the post-mastoidal route, dividing the operation into four stages, which are as follows:

I. Cutaneous incision: This extends along the anterior border of the muscle from the level of the angle of the lower jaw downward for from eight to ten centimetres' distance.

II. Disengagement of the anterior border of the muscle: Following the incision he cuts down to the edge of the muscle which is freed by the use of grooved director. The muscle is then held back by an assistant and the sheath of the vessels searched for. The larynx is drawn forward by another assistant.

III. Search for, disengagement, and resection of the ganglion: The sheath of the vessel is opened and the operator passes the instrument between the jugular vein and the internal carotid artery. These vessels are held apart, the vagus being placed in juxtaposition with the artery. By means of the director the posterior sheath and the pro-vertebral aponeurosis are opened. After the exposition of the inferior end of the ganglion, the whole ganglion is bared with the index finger, and all of its branches are cut with a blunt pointed curved scissors. The ganglion is then seized with a forceps, torn out and excised at its superior continuation.

IV. Closing of the wound: Two rows of sutures are employed. The one which is deep and made of cat-gut, is so placed as to unite the anterior border of the muscle to the sub-cutaneous tissue; the other is so situated as to close the skin-wound. No drainage is used.

Two Cases of Unilateral Hysterical Amaurosis.

PLAUT. (*La Clinique Ophthalmologique*, June 25, 1898.) Both of the cases seen by Plaut were in women and in both, the diagnosis of hysteria was made certain by the presence of general symptoms. Both gave a history of similar attacks, though the author believes that the trouble appeared gradually. The interesting feature of these cases was that, diplopia could be produced in each instance by the use of prisms. Cures were easily effected by electricity and suggestion.

On the Relationship Between Hernia of the Iris and Sympathetic Ophthalmia.

VAUCHER, ORLEANS. (*La Clinique Ophtalmologique*, July 25, 1898.) Vaucher's experience in several cases of this nature has led him to the conclusion that unless the iris itself is wounded, conservative measures are the best, lest a bad condition be made a worse one. On the other hand, he believes that operative measures should be employed whenever the iris is injured.

Some Supplemental Remarks on the Origin of Certain Forms of Sub-Conjunctival Cysts.

ROGMAN, GAND. (*Archives d'Ophtalmologie*, August, 1898.) In a brief article upon this subject, Rogman adds one case of his own and several reported by other authors to those that he published in 1895. He states that the form of cyst under consideration is purely conjunctival in type. He holds to the view, as in his former paper, that these cysts are due to the occlusion of a fold of the conjunctiva, and he believes that they may appear with or without any primary inflammation.

Sub-Conjunctival Injections of Mercury in the Treatment of Blenorrhagia of the Conjunctiva.

SYKLOSSI, JR. (*Annales d'Oculistique*, July, 1898.) Syklossi prefaces his paper by a plea for a microscopical examination of the discharges in all of the cases which evidence signs of gonorrheal origin. He tabulates the result of a great number of patients that were treated in this manner with favorable results. Following his experience, the best results were obtained in those eyes that showed a tendency to infiltration of the cornea, ulcer with infiltration, and necrosis. He tends to the opinion that the injections act principally by stimulating lymph-circulation.

A Case of Melanotic Sarcoma of the Chorioid.

LAGRANGE AND FLOUS, Bordeaux. (*Annales d'Oculistique*, August, 1898.) The case reported by these authors was interesting for the following reasons:

I. The tumor consisted of a deeply pigmented intra-ocular mass and an extra-ocular growth with but little pigment.

II. The pigment was exclusively of chorioidal origin:

III. The extra-ocular part of the tumor was formed by an outgrowth through several narrow and regularly formed openings in the equatorial region of the intra-ocular portion.

IV. Clinically, the most striking features in the case were the extreme slowness of the growth of the neoplasm and the absence of any constitutional symptoms.

NOTES AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest to its readers. Please address Albert B. Hale, M. D., 103 State street Chicago.)

Königshöfer (Stuttgart) has been made a professor of Ophthalmology.

Mrs. Annie S. Patton has bequeathed \$50,000 to the Manhattan Eye and Ear Infirmary.

The ninth annual Congress for teachers of the blind was held in Berlin on the 26th of July.

LEIPZIG. Dr. Otto Schwarz has been made a Professor (extraordinary) of Ophthalmology.

BONN. Dr. Albert Peters is advance from Privat-docent to Professor (extraordinary) of Ophthalmology.

Prof. Hermann Cohn (Bresan), on July 24, celebrated his 30th year of service in Ophthalmology at the University.

MUNICH. Dr. G. Salzer has been appointed Privatde-docent for Ophthalmology. His theses were: Artificial Substitutes for the Cornea; Pseudoplasma Iridis.

Jacobsohn (Berlin) says (Medico, No. 25, 1898) that syphilitic eye affections are about 1.5 to 3 per cent. of all cases in his clinic, but mostly they appear in the latter stages of the disease.

Dr. Julius Fejer, who for many years has been assistant to Prof. Szily in the eye department of the Jewish hospital at Budapest, has been appointed professor in the same institution.

CHICAGO. Dr. Frank Allport, recently of Minneapolis, has been elected Professor of Ophthalmology in the Chicago Policlinic, and has just become one of the attending ophthalmic surgeons at St. Luke's Hospital.

The medical faculty of the University of Munich offers the following subject as an essay for the prize for the year 1898-99: To prove by clinical and experimental investigation whether and in what way a primary disinfection of a fresh but infected wound can be accomplished.

Hirschberg (Berlin) remarks with emphasis on the great amount of blindness in Spain. Of the many blind persons he saw there both in the streets or in houses, the majority had a history of trachoma to account for it. The proportion in Spain is 14.8 : 10,000; in Germany it is only 9 : 10,000.

During the meeting of the Ophthalmological Congress, at Heidelberg, the bust of Otto Becker was unveiled before a large number of his former friends and students and teachers of ophthalmology from all parts of the world. The presentation speech was made by Benheiner (Vienna).

Veasy (Philadelphia) uses talodin-blue in solution of 1 : 10,000 to 1 : 50 (preferring that of 1 : 1000) as a collyrium in all eye troubles, after first washing the conjunctiva with a simple salt solution. It acts as a good antiseptic eye wash, and also stains all abrasions of the tissues. It acts not only as a good antiseptic and wash, but it also stains all abrasions in the same way that fluorescein does.

The total number of blind in the United States is nearly 49,000, or 976 in the 1,000,000 of the population. The number of blind reported as receiving instruction is 4,691. The number of blind who are also deaf mutes—of whites, 84 males, 109 females; of blacks, 28 males, 29 females. Of blind, who are also idiots, these are—of whites, 595 males, 463 females; of blacks, 66 males, 62 females.

The *Deutsche Medicinische Wochenschrift* and the *Wochenschrift für Hygiene und Therapie des Auges* have condemnatory remarks about a certain proprietary medicine called "earnestin" which is advertised as extracted from a rare South American deep-sea fish, the drug being apparently identical with common cod liver oil. It is recommended as a cataract cure, and costs 12.50 marks a bottle.

At the Edinburg's meeting of the British Medical Association, July 8, 1898, the Ophthalmological section elected the following officers: President, H. Swanzy. Vice-presidents, Sir W. R. Gowers, Drs Argyll-Robertson, Marcus Gunn, R. Williams, E. Nettleship, H. Ealer, W. Brailey, P. Smith, F. Cross, G. Cowell. Treasurer, J. Abercrombie. Secretaries, J. Taylor, E. T. Collins. Librarian, W. A. Frost.

Radziejewski (Berlin), in the *Berliner Klinische Wochenschrift*, June 27, 1898, has an exhaustive article on the use of the Supra-renal extract in ophthalmology, with remarks as to general organo-therapy in this specialty. He was induced to study this product by accidentally noticing its effect on mucous membranous in general. The article deals with the pharmacology of the extract more generously than is usually done.

Prof. Dr. v. Mielhel, Würzburg, celebrated his 25th anniversary as professor of ophthalmology. He taught in Zurich, Leipzig, Erlangen and Würzburg. There was a spontaneous reception tendered to him unofficially by his colleagues, as only 50 year anniversaries are officially recognized by the University of Würzburg. Deputations were received from 11 army corps, his private students and students corporation, the officers of the university and of the city.

July 8, 1898, Dr. Theodore Bänziger, oculist of St. Gallen, died after a long illness having reached 70 years of age. He was one of the oldest students of A. v. Graefe. In the ophthalmoscopic room of the latter's clinic there is pointed out a spot on the wall which Bänziger made by throwing up his ophthalmoscope in the air in an ecstasy of joy on first observing the optic nerve in the living subject. Bänziger brought Graefe's methods to Switzerland and practiced with much success.

Anales de Oftalmologia is a new monthly publication, issued from the City of Mexico, by Dr. Manuel Uribe Troneco and Dr. Daniel L. Vélez. The aim of the editors is to furnish a permanent vehicle, in Spanish, for technical articles, either original or abstracted, which have hitherto appeared only in their general medical literature; but Spanish ophthalmology has grown to such dimensions that the editors feel that a special publication will be of good help to all those interested directly in the eye. The associate editors are among the best men of the two Americas.

(Berlin Correspondent *London Mail*, August 16.) Of late years the attention of savants has been directed to the investigation of "Planeton," under which name the red and yellow coloring of portions or the surface of the ocean is known. All the expeditions leaving German ports this year have instructions to pay special attention to the matter, and ordinary sea captains are encouraged to chronicle all particulars regarding any appearance of the phenomenon that may come under their notice. In the German "Notes on Hydrography and Maritime Meteorology," Herr H. Haltermann, of the naval observatory at Hamburg, recapitulates the present state of knowledge on the subject, from material supplied by learned and unlearned men. According to these authorities, most of whom are officers of ships in some way connected with the German naval observ-

atory, the reddish coloring of the ocean is of more frequent occurrence than the yellow. Both colors occur most frequently in the South Atlantic, but always at considerable distances from each other. The yellow tracks are found principally in the tropical and subtropical western parts of the ocean, not far from land. The red tracts, which are probably caused by animals related to the *Clio borealis*" and "*Limacina aretia*" (the food of whales), are found in the southern latitude of the Atlantic, where the influence is felt of the cold currents from Cape Horn. It is, however, somewhat remarkable that no reference is made in any log to the appearance of red tracts in the seas in the immediate neighborhood of Cape Horn. The yellow tracts are generally ascribed by captains to pollen or flowering waterplants, while the red tracts are often described as being caused by the presence of small animals such as shrimps, flea-lobsters, etc. It has also been noted that the red tracts are usually accompanied by whales and immense flocks of birds, which is seldom the case with the yellow tracts. Much is expected from this year's scientific maritime expedition toward solving the mystery of the wonderful appearance.

The St Louis Eye, Ear, Nose and Throat Hospital, located at 500 North Jefferson avenue, St. Louis, was opened to the public April 1, 1898. The Eye Department is in charge of Dr. J. Ellis Jennings, and the Ear, Nose and Throat Department in charge of Dr. Leo Caplan. The ground floor is entirely devoted to the out door Department and is open to the poor from 2 to 4 p. m. daily except Sunday. Care is taken to exclude from free treatment persons able to pay for professional services. The Institution will be incorporated and have the privilege of giving post graduate courses in diseases of the Eye, Ear, Nose and Throat and of issuing certificates of diplomas to those who have taken the courses.

BOOK NOTICES.

STEREOSCOPIC PLATES.

V. PFLUGK, A., Wiesbaden. (*Stereoskopische Bilder*. J. F. Bergmann, 1897, 24 Tafeln zum Gebrauch für schielende 2.00 Mk.)

These plates are recommended for strabismus, each picture is cut in two and each part should be brought together by the stereoscope; by lowering the eyes in outward squint the halves of the picture are moved as far apart as possible; in internal squint the pictures are brought as near the middle line as possible; strabismus cases learn to bring both halves into one picture. H. V. W.

CARDS FOR DIAGNOSIS OF COLORBLINDNESS.

NAGLE, WILIBALD A. (Privatdocent der Physiologie in Freiburg i. Br. *Tafeln zur Diagnose der Farbenblindheit*. J. F. Bergmann. Wiesbaden, 1898, price 1.20 Mk., about \$.30.)

These consist of a series of 12 cards about 4x5 inches with accompanying text for instruction. The confusion colors are arrayed in a series of disks which compose a circle; by the patient designating those which seem to him reddish or greenish, colorblindness or deficient color perception is diagnosed. They are a cheap addendum to our other color vision tests. H. V. W.

THE SIDEROSCOPE.

ASMUS, E., of Düsseldorf. (*Das Siderskop und seine Anwendung*. 86 pp., 4 plates and 6 illustrations in the text, J. F. Bergmann, Wiesbaden, 1898. 2.40 Mk., \$.60.)

In this little book the author has collected his previous communications. He has succeeded in devising a magnetic instrument which detects the presence and locality of iron or steel splinters in any part of the body. Its principal use may be seen in connection with the eye. The use of the sideroscope in a number of cases is duly shown. Those who are specially interested must refer to the original work for a full description of the instrument. H. V. W.

PROGRESS OF BACTERIOLOGY OF CONJUNCTIVITIS AND KERATITIS.

UTHOFF, W. (*Ueber d. neueren Fortschritte d. Bacteriologie auf d. Gebiete d. Conjunctivitis u. d. Keratitis des Menschen*. Sammlung zwangloser Abhandlungen a. d. Gebiete d. Augenheilkde Bd. II, 4 Heft, Halle a. S., K. Marhold 1898, 41 pp. 1.40 Mk.)

In the first part of this work Uthoff deals with the micro organisms which are known to be irritant to the human conjunctiva; to these belong Neiser's gonococcus the cause of conjunctivitis gonorrhea, the Fraenkel-Weichsel diplococcus, (the pneumococcus) which causes

pneumococcus conjunctivitis, the Koch-Weeks bacillus, the cause of conjunctivitis folliculosa, the streptococcus which sometimes gives rise to conjunctivitis, the Klebs-Loeffler diphtheria bacillus and the diplobacillus which cause a characteristic conjunctival disease. In the close of this chapter the question of the micro organism of trachoma is considered. The second chapter deals with the bacteriology of human keratitis; the pneumococcus causes the ulcer serpens in hypopion keratitis. There are also found other pus producing germs, the staphylococcus bacillus, etc., in keratomyosis aspergillina only the aspergillus fumigatus has been definitely studied. Other micro-organisms which may sometimes be the cause of keratitis are the Fraenkel-Weichselbaum capsule-diplococcus, the streptococcus, staphylococcus, Pfeiffer capsule bacillus, pyogenes foetidus, bacterium coli bacillus pyocaneus, tubercule bacillus, diplobacillus, ozaenabacillus, aspergillus fumigatus and the leprabacillus.

H. V. W.

TEXTBOOK OF OPHTHALMOLOGY.

FUCHS, ERNST, Vienna. (*Lehrbuch der Augenheilkunde.*) Enlarged 7th edition with 257 wood cuts. Franz Deuticke, Leipzig & Vienna, 1898.

The first edition of this well known text book was published in 1889, and it is not only remarkable but shows the popularity of the work to have reached seven editions in nine years. The success of the book has been principally due to the clear style, easy language and thorough treatment of the subject. The precise language of the text is much like that of the lecturer and, all in all, is one of the best clinical works published.

The author has followed the tradition of Arlt's school of practice and gives preponderance to the external disease of the eye, laying great weight upon symptoms and the appearances observed by simple inspection.

Two forms of type are used; the larger in describing subjects of importance and the smaller for subdivision and finer ramifications, which method is a decided help to the beginner in ophthalmology.

The smaller print is devoted to theoretic views, points of interest to the practicing ophthalmist, pathologic, experimental and bacteriologic researches which are of special interest. The author and publisher are to be praised upon the appearance of the type and the illustrations, of which there are 44 new ones.

The text book of Fuchs is, without doubt, the best of its kind in German ophthalmic literature. The translation of former editions has gained it popularity in America.

H. V. W.

SALZER, FRITZ, of Munich. (*Ueber den Künstlichen Hornhautersatz.* J. F. Bergmann, Wiesbaden, 1898. 65 pp., one plate, 13 fig. in text, price 1.80 Mk.)

The author shows that partial keratoplasty, with insertion of a rock crystal button, which may be tolerated for a year or more, is possible under antiseptic precautions. Transplantation of living

corneal tissue has proved a total failure as, if not thrown off by necrosis, the piece is absorbed and the locality again becomes opaque through interstitial tissue deposit. The only possible solution for production and retention of a transparent place in the cornea, in the case of total leucoma, is by insertion of a chemically inert body in hopes that it may become encysted. Salzer seems to have accomplished this in several cases by using a button of rock crystal with a ring of platinum in which are hooks which are imbedded in the cornea. Judging from the results of former investigations, starting with that of Nussbaum, the artificial cornea must be composed of a body which is insoluble, and it must be so placed and retained by a number of separate points that it will not come out, and the operation must be done in such a manner that the healing following the trepanation does not shove out the inserted crystal.

He has, therefore, made his rock crystal in the collar button form advocated by Nussbaum combining it with that of Von Hippel, who jacketed it in a band of metal (gold). He makes the jacket of platinum and adds a number of hooks, which are forced into the cornea and hold the button in place. These hooks do not apparently cause ulceration or irritate the cornea. The author has pursued this work with commendable energy in endeavoring to produce a practical result, and seems to have accomplished it so that by this operation perhaps some blind persons, with fairly normal eyes, except the total leucoma, may, perhaps, for a time at least, regain a modicum of vision. He gives the following indications for the operations:

1. The inflammatory process must have entirely ceased for a long time before.
2. The cicatricial tissue must have undergone a complete contraction and there must be no bulging.
3. The tension must be normal.
4. Light sense and projection must be good, even to seeing the movement of the hand and colors, as otherwise no optical results will be obtained.

Naturally the author recommends a number of instruments peculiar to this operation, the simplest of which is the forceps, with which the glass plug is inserted into the trephine opening. It seems that the operation may be done under cocaine anesthesia, the first step being to make an opening through the entire thickness, removing a disk of tissue, then a flap is made with a knife and the rock crystal button inserted through the opening into the anterior chamber, and the button pushed through the trephine opening, the hooks being forced into the under surface of the cornea. He has had one case in which the patient carried this button and was able to see something 11 months after the operation (a photograph of this case is shown) and has done the operation on six or seven others with more or less satisfactory results. The enthusiasm of the author for this problem is somewhat contagious. I would advise my readers to procure a copy of his work before attempting the operation, even on dogs.

H. V. W.

THE STOCKHOLM EYE CLINIC.

(Mitteilungen aus der Augenklinik des Carolinischen Medico-Chirurgischen Institut zu Stockholm. Herausgegeben von Dr. J. Widmark, Professor der Augenheilkunde — zu Stockholm. Jena Verlag von Gustav Fischer. 1898. Preiss 7 mark.)

Contributions from the Eye Clinic of the Carolus Medico-Chirurgical Institute at Stockholm. Edited by Dr. J. Widmark, Professor of Ophthalmology at Stockholm. Published by Gustav Fischer, Jena, 1898. Price 7 marks. 251 pages.

Every thing produced by the house of Fischer, at Jena, not only is easy reading, on account of the delightful paper, clear print, choice type and thoroughness of finish, but is also well worth reading for the solidity and dignity of the matter furnished. This first volume contains six reprints of articles already published in Swedish, but which have received such commendable notices that the editor thought it best to republish them in a language which should insure them easier access for a larger body of readers. These essays are titled as follows:

- I. The location of the papillo-macular bundle (Widmark).
- II. Statistics concerning myopia (Widmark).
- III. The border of the visible spectrum on the violet end (Widmark).
- IV. Experimental investigations on disinfection of the conjunctival sack (Dalén).
- V. Mechanic and therapeutic treatment of trachoma (Hellgren).
- VI. Operative treatment of immature and of partial (stationary) cataract (Widmark).

The first and third essays have, of course, both physiological and pathological interest, but can hardly be reviewed without going into too great deal. The second essay shows a mass of investigated literature, as well as carefully compiled statistical tables concerning myopia in Sweden, from which I learn, to my surprise, that myopia is nearly as common in Sweden as in Germany and consequently increases *pari passu* with the age, but we Americans are interested in it only as it accentuates the thesis that the higher intellectual life (so far as our present hygiene knows) entails a loss of visual acuity beyond our near point.

The fourth essay, by Dalén—Disinfection of the Conjunctiva—is a master piece. The painstaking experiments, the unprejudiced citation of many authors (Gifford, Petresco, Santos-Fernandez, Lachszewicz, Welch, Chisolm, Gasparini, Weeks, Stehégoleff, among many others), the clearness and impartiality of method by which control tests are made and theories demonstrated—all stamp the work as one of the best I have read, and without which no literature reference can be complete. I wish it were translated into English, as I despair of giving an adequate resume of the work done or conclusions drawn. The first question to be solved is that of asepsis or antiseptics. Asepsis of the conjunctiva cannot be systematically achieved—such is his answer. Again, as to whether to use an antiseptic (sublimate)

solution for conjunctival flushings or a simple indifferent (decinarmal salt) solution for that purpose; whether the length of time a bandage is worn influences the growth of bacteria; whether an antiseptic or an aseptic bandage is the better; whether iodoform on the conjunctiva is of advantage; are all questions met and solved by Dalén in an unimpeachable manner. He concludes that the indifferent (salt) solution is a somewhat better flushing material than sublimate; that the longer a bandage is worn, the greater is the colony of bacteria, no matter how pure at the beginning the conjunctiva might be. Also that a non irritating antiseptic bandage is preferable to a simple sterile bandage, but that the difference is not great. And, strange to relate, that iodoform powder in the conjunctival sac has no restraining influence whatever on the bacteria assembled there.

The fifth essay, Hellgren, on the treatment of trachoma, is a comparison of various mechanical methods which leads to the acknowledgement of the superiority of Knapp's roller expression forceps.

The sixth essay, by Widmark, on the operative treatment of immature and partial cataracts, is a brilliant monograph on a special subject. Widmark discusses three methods of preliminary operation. Discission, iridectomy and cortex trituration.

Discission, though applicable in a few cases, especially of young subjects, and though still having some enthusiastic advocates, is in general not to be undertaken.

Iridectomy (of course in this case preliminary), as advocated by Mooren, Critchett and others, he acknowledges to be of great service in many cases, and quotes Jackson's experience in support of this view, while showing at the same time that it is not altogether harmless and, apart from infection, may start up an iritis or irritation of other tissues. Since the so-called "simple operation," Widmark has seldom attacked the iris.

Cortex trituration—Förster's, Bettman's operation—is examined with equal impartiality. This method Widmark evidently prefers for its undoubted action on the lens, so that in cases of necessity it may be resorted to with confidence, but he makes no efforts to deny its dangers, or to obscure the fact that after many an apparently perfect operation there will show itself a subtile iritis that may delay repair and vision long beyond the usual limit.

Widmark then gives his experiences on the immediate extraction of the immature lens, and concludes that "in that period of life in which the physiological senile changes in the lens have destroyed accommodation—i. e., toward the end of the fifties and certainly in the sixties—every cataract can be operated on when the visual destructiveness warrants." The question is less easy in any eye below this, but he formulates the following rules (after Schweigger):

1. Under 10 years discission, finally extraction as a last resort.
2. Between 20 and 40, discission and extraction.
3. Between 40 and 60, cortex massage followed by extraction.
4. Above 60, extraction in any case.

A. B. H.

PHYSIOLOGICAL OPTICS.

TSCHERNING. *Optique Physiologique*. Georges Carré et C. Naud, Paris, 1898.

As I write there lies before me on my office table Tscherning's "*Optique Physiologique*." It would be hard to find a more interesting work to place in the hands of the student of ophthalmology. Beginning with the simplest laws of optics the first chapter is devoted to a discussion of lenses and mirrors and of the various mathematical rules upon which the laws of refraction and reflection are founded. This leads to a description of the optical system of the eye, to which the second chapter is devoted. The false images of the eye are next treated of, this being followed by an article on ophthalmometry, theoretical and practical. Here are included the methods of measuring the cornea, the examination of the peripheral portions of this organ, the use of the ophthalmophakometre, and the determination of the positions and centres of the internal surfaces of the eye. The fifth chapter is devoted to the subject of the circles of diffusion of the retina. In this connection Young's optometer is explained. By a natural sequence the anomalies of refraction are reached. One thing that will in these pages attract the attention of the American reader is the statement that the quarter and even half dioptries may be disregarded in the correction of hyperopia and hyperopic astigmatism. The author also depreciates the use of mydriatics, considering that the aberration of sphericity leads to an incorrect result. This and the chromatic forms of aberration are dwelt upon in the next two chapters. Full descriptions of astigmatism and of the entoptic phenomena are then entered upon. In the discussion of the subject of accommodation Tscherning gives at some length his own theory in regard to the matter. Briefly speaking it is as follows: He considers that owing to the tension produced upon the capsule by the contraction of the ciliary muscle, the more peripheral portions of the anterior surface of the lens, principally, and of the posterior surface partly, tend to flatten out. This is due to the fact that the denser nucleus, which is relatively thicker at the centre than at the sides, prevents the two surfaces from approaching each other as closely in the latter as in the former region, thus naturally producing a greater degree of curvature at the centre. The first book closes with articles on ophthalmoscopy, skiascopy, and the pupil.

The second book treats, under the following heads, of the functions of the retina:

I. The changes which the retina undergoes under the influence of light.

II. The sense of light perception.

III. The color perception.

IV. The sense of form.

The third and last book is devoted to the ocular movements and binocular vision. Listing's law, the ocular movements, the projection of visual impressions, monocular and binocular perception of

depth, and strabismus, are discussed in the same clear, concise manner that marks the whole volume. Tscherning closes with an interesting description of the more common optical illusions.

It is well to note that at the end of each chapter and at the end of the volume is a list of the works referred to. The frequency of the author's own name shows how much original material is introduced, and eliminates at once the idea that this is simply a making over of work already too frequently covered. Although primarily intended for beginners in the study of ophthalmology, being in reality a series of lectures delivered to a party of American students at the Sorbonne, it is safe to say that there are but few oculists who would not gain from a perusal of these pages. The theoretical leads so easily to the practical, the numerous illustrations aiding so much in the understanding of both, that nowhere does the reader's interest flag and it is with a sense of regret that the last page is reached. Taken altogether, or in parts, this little book reflects great credit upon its distinguished author, and is a fair sample of the work of the modern French school of medicine.

H. A. ROTHROCK.

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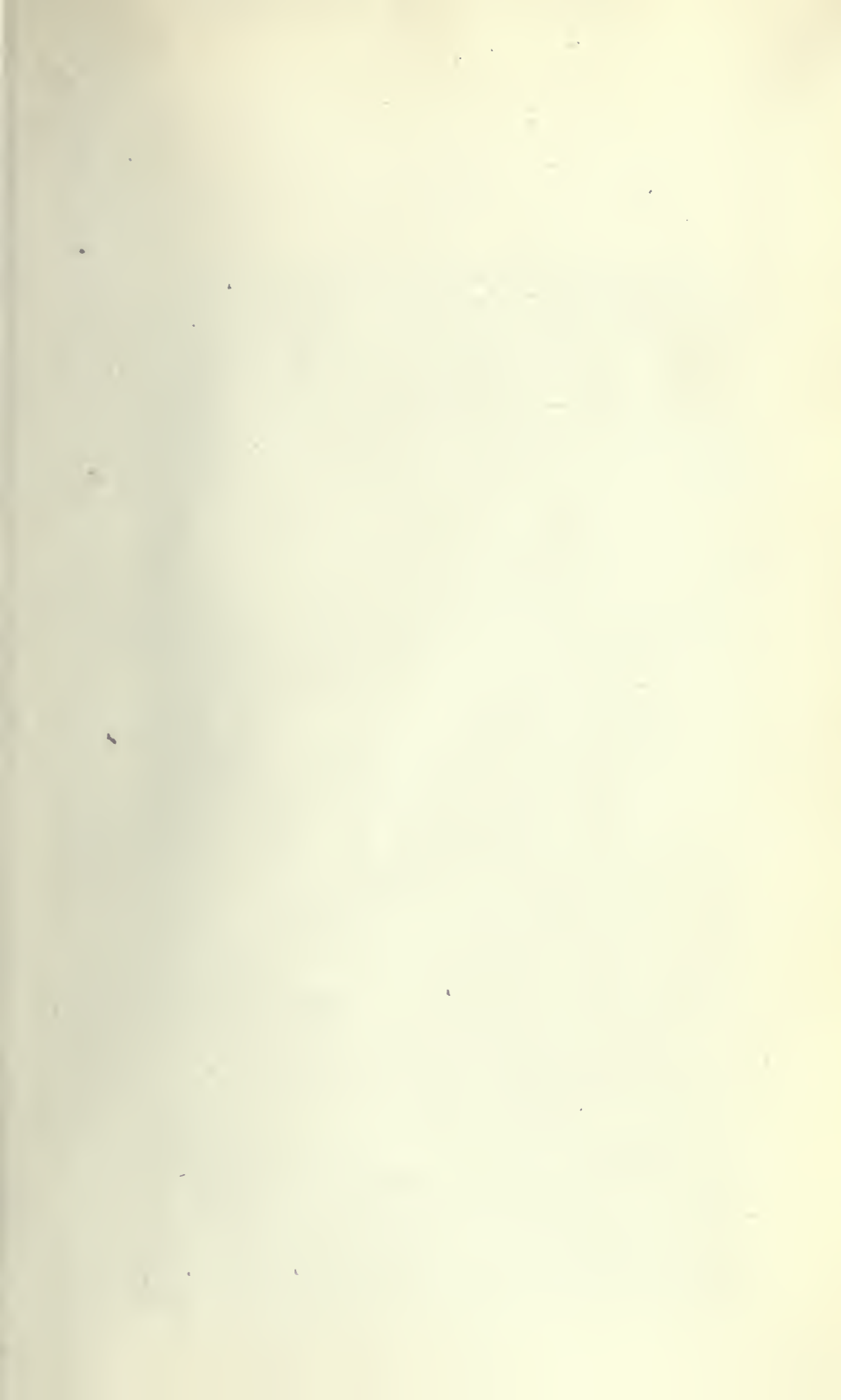
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